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Roy. G. Finch
N. Y. State Engineer

STATE OF NEW YORK

SUPPLEMENT

TO THE

ANNUAL REPORT

OF THE

New York (State).

State Engineer and Surveyor

For the Year Ended June 30, 1921



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ENGINEER OF CLAIMS

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REPORT
ON
HYDRAULIC DATA
1921

DEPARTMENT OF STATE ENGINEER AND SURVEYOR
COMPRISING THE TWENTY-SECOND ANNUAL REPORT ON
STREAM GAGING

[3]

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REPORT ON STREAM GAGING FOR 1921

HON. FRANK M. WILLIAMS, *State Engineer and Surveyor*:

SIR.— There is presented herewith the report containing the results of the hydraulic work of the Department of State Engineer and Surveyor for the fiscal year ended June 30, 1921.

This report contains hydraulic and precipitation data obtained during that period and available on the date submitted, as follows: Records of water-surface elevations, of the discharge of streams and of precipitation in the Barge canal zone, collected by this Department, gages, however, located at points convenient to Barge canal locks, dams or other structures, where employees of the Department of Public Works are stationed, are read by them; gaging records of streams throughout the remainder of the state, furnished by the United States Geological Survey in coöperation either with this Department or with the New York State Conservation Commission; stream discharge and precipitation, mainly in the Catskill watersheds, supplied by the Board of Water Supply of the city of New York; United States Weather Bureau records, and other stream gagings furnished by corporations or individuals. Credit for same, where due, is given in connection with the several station records. The aim of this report has been to publish not simply data secured by this Department, but all available stream flow data in the State during the year in one volume for the convenience of the public. This comprehensive treatment does not apply, however, to rainfalls records.

No new gages were established during the year, but beginning April first records were kept from existing gages of the water-surface elevations of the Mohawk river above and below locks Nos. 8, 9, 10, 11, 12, 13, 14, 15 and below lock No. 16.

The following table shows the number of stations maintained by various departments and organizations, records of which are on file in the office of the State Engineer:

MAINTAINED BY	Water surface elevation	Discharge	Precipitation
Department of State Engineer.....	134	2	16
United States Geological Survey.....	4	57	.....
United States Weather Bureau.....	.....	.....	6
Board of Water Supply of New York City.....	.....	3	29
Miscellaneous.....	.....	4	4
Totals.....	138	66	55

Gages maintained by this Department to determine water-surface elevations are in general read to the nearest tenth foot with only occasional half-tenth foot readings and the hundredths of feet appearing in the tables of water-surface elevations are due to the elevations of the zero of the gage and should not be understood to indicate readings to hundredths of feet.

In a report of this kind, where the accuracy of the data from which the tables and computations are made depends largely on the care of the observers at the various stations and on natural conditions affecting stream flow, apparent inconsistencies will be found, but it is believed that the observers are in general faithful in the performance of their duties and that such errors as may occur do not seriously impair the value of the records.

Respectfully submitted,

A. H. PERKINS,

Division Engineer.

December 1, 1921.

RECORDS NOT PUBLISHED

Water-surface elevations were obtained at the following stations during the year, but in the interests of economy their records are not published in this report. However they are on file in this office and copies may be obtained on application to the State Engineer:

Barge canal:

- Below lock No. 27, Lyons.
- Below lock No. 34, Lockport.
- Above lock No. 35, Lockport.

Canandaigua outlet:

- Above retention dam at Lyons.

Champlain canal:

- Above lock No. 9, Smith's Basin.

Clyde river:

- At Clyde.
- Above lock No. 25, May's Point.
- Below lock No. 25, May's Point.

East Canada creek:

- Above dam of the Utica Gas and Electric Co.
- Below dam of the Utica Gas and Electric Co.

Ganargua creek:

- Above dam at Palmyra.

Hudson river:

- Above dam at Fort Miller.
- Below dam at Fort Miller.
- Above dam at Northumberland.
- Below dam at Northumberland.
- At Liberty Mills.
- Above dam at Stillwater.
- Below dam at Stillwater.
- Above Federal dam at Troy.
- Below Federal dam at Troy.

Limestone creek:

- Above State dam at Fayetteville.

Limestone feeder:

- Below headgates at Fayetteville.

Lake George:

At Glen Island.

At Rogers Rock.

Mohawk river:

Above State dam at Rome.

Above retention dam at Rome.

West of guard gate at Rome.

East of guard gate at Rome.

Above lock No. 20 at Whitesboro.

Below lock No. 20 at Whitesboro.

At Ilion.

At Herkimer.

Above State dam at Little Falls.

Below lock No. 17, Little Falls.

Below lock No. 16, Mindenville.

Above lock No. 15, Fort Plain.

Below lock No. 15, Fort Plain.

Above lock No. 14, Canajoharie.

Below lock No. 14, Canajoharie.

Above lock No. 13, Randall.

Below lock No. 13, Randall.

Above lock No. 12, Tribes Hill.

Below lock No. 12, Tribes Hill.

Above lock No. 11, Amsterdam.

Below lock No. 11, Amsterdam.

Above lock No. 10, Cranesville.

Below lock No. 10, Cranesville.

Above lock No. 9, Rotterdam.

Below lock No. 9, Rotterdam.

Above lock No. 8, Scotia.

Below lock No. 8, Scotia.

At Schenectady.

At Waterford.

Onondaga lake:

At Long Branch.

Oswego river:

Above dam at Phoenix.

Below dam at Phoenix.

Above upper dam at Fulton.

Below upper dam at Fulton.

Above lower dam at Fulton.

Below lower dam at Fulton.

Above curved dam at Oswego.

Below headgates in hydraulic canal, Oswego.

At Bridge street in hydraulic canal, Oswego.

Schoharie creek:

At Middleburg.

Seneca river:

At R. S. & E. R. R. bridge.

Above Cross Lake.

Below Jack's Reef.

At Belgium.

Tonawanda creek:

Near Pendleton.

West Canada creek:

Above Power dam, Trenton Falls.

Above Morgan dam, Trenton Falls.

At Kast Bridge.

Wood creek:

Above retention dam, Smith's Basin.

Below lock No. 9, Smith's Basin.

Above lock No. 11, Comstock.

Below lock No. 11, Comstock.

Above lock No. 12, Whitehall.

REPORT OF UNITED STATES GEOLOGICAL SURVEY

DEPARTMENT OF THE INTERIOR

UNITED STATES GEOLOGICAL SURVEY

ALBANY, N. Y., *February 16, 1922.*

Hon. FRANK M. WILLIAMS, *State Engineer and Surveyor,
Albany, N. Y.:*

Dear Sir.—I have the honor to transmit herewith a report on the hydrometric work carried on by the United States Geological Survey in coöperation with the State of New York for the fiscal year ended June 30, 1921.

The work has been performed in coöperation with your Department and with the Division of Inland Waters of the Conservation Commission under the general direction of Mr. N. C. Grover, Chief Hydraulic Engineer, and Mr. John C. Hoyt, Engineer in charge of the Division of Surface Waters for the Geological Survey.

The accompanying report has been prepared under my direction by Mr. Arthur W. Harrington, Hydraulic Engineer, assisted by Mr. B. F. Howe and Mr. E. B. Shupe, Assistant Engineers, and Miss Bessie I. Gould, Clerk.

Acknowledgments are due engineers from your Department and from the Division of Waters of the State Conservation Commission for assistance rendered in the field and office.

Yours very truly,

C. C. COVERT,
District Engineer.

REPORT OF HYDROGRAPHIC INVESTIGATIONS CARRIED ON BY THE
UNITED STATES GEOLOGICAL SURVEY IN COÖPERATION
WITH THE STATE OF NEW YORK CONSERVATION
COMMISSION AND THE STATE ENGINEER
AND SURVEYOR

SCOPE OF WORK

There were maintained during the year sixty-two stations, four of which were for water-surface elevations only. The published data gives 613 months of records, an average of 11.6 months per station per year. Eliminating the canal stations which do not operate during the winter months, every station but the Genesee river at Rochester and the Raquette river at Piercesfield is complete as to monthly discharge.

There were 467 discharge measurements made, 450 of which were at regular stations.

FINANCIAL STATEMENT

Expenditures:

State of New York Conservation Commission....	\$12,343 81
State Engineer and Surveyor	3,995 98
United States Geological Survey.....	5,793 31
Miscellaneous — power companies and municipali- ties interested	394 87

Distributions:

Operation and maintenance	10,376 01
Office and top cost	9,795 77
Observers' pay	2,356 19

STATIONS MAINTAINED

Hudson River at Gooley, near Indian Lake.	Genesee River at Jones Bridge near Mt. Morris.
Hudson River at North Creek.	Genesee River at Driving Park Avenue, Rochester.
Hudson River at Thurman.	Canaseraga Creek near Dansville.
Hudson River at Spier Falls.	Canaseraga Creek at Shakers Crossing.
Hudson River at Mechanicville.	Keshequa Creek at Craig Colony, Sonyea.
Opalescent River at Flowed Land.	Conesus Creek near Lakeville.
Indian Lake Reservoir near Indian Lake.	Canadice Lake Outlet near Hemlock.
Indian River near Indian Lake.	Barge Canal near South Greece.
Schroon River at Riverbank.	Barge Canal at Lock 32, Pittsford.
Sacandaga River near Hope.	Barge Canal at Lock 30, Macedon.
Sacandaga River at Hadley.	Owasco Outlet near Auburn.
Feeder Canal at Glens Falls.	Black River near Boonville.
Barge Canal at Lock 9, Smith Basin.	Black River at Watertown.
Hoosic River near Eagle Bridge.	Forestport Feeder near Boonville.
Mohawk River at Crescent Dam.	Black River Canal (flowing south) near Boonville.
West Canada Creek at Hinckley.	Moose River at Moose River.
West Canada Creek at Kast Bridge.	Middle Branch Moose River at Old Forge.
Nine Mile Feeder near Holland Patent.	Beaver River at State Dam near Beaver River.
Wallkill River at Pellets Island Mountain.	East Branch Oswegatchie River at Newton Falls.
East Branch Delaware River at Fish Eddy.	Oswegatchie River near Heuvelton.
Delaware River at Port Jervis.	West Branch Oswegatchie River near Harrisville.
Beaver Kill at Cooks Falls.	Raquette River at Piercefield.
West Branch Delaware River at Hale Eddy.	St. Regis River at Brasher Center.
Susquehanna River at Conklin.	Richelieu River at Ft. Montgomery, Rouses Point.
Chenango River near Chenango Forks.	Lake George at Glen Island.
Chemung River at Chemung.	Lake George at Rogers Rock.
Tioga River near Erwins.	Ausable River at Ausable Forks.
Cohocton River near Campbell.	West Branch Ausable River near Newman.
Allegheny River at Red House.	Saranac River near Plattsburg.
Cattaraugus Creek at Versailles.	
Little Tonawanda Creek at Linden.	
Genesee River at Scio.	
Genesee River at St. Helena.	

HYDRAULIC DATA

DEFINITION OF TERMS

Barge canal datum is sea-level (mean tide) at Governor's Island, which has been taken as 14.73 feet below the "Grist-mill" bench-mark in Greenbush (now Rensselaer). This bench-mark was established by the United States Coast and Geodetic Survey in 1857 and is described as a cross cut in the face of the cellar wall of an old grist-mill at Greenbush, opposite Albany. This structure was replaced about 1905 by an office building on the same foundation and is now owned by the Cornell Steamboat Company. The elevations given herein, unless otherwise noted, are feet above Barge canal datum indicated as (B. C. datum), which is the datum used in the construction of the Barge canal by the State of New York.

The volume of water flowing in a stream — the "run-off" or "discharge" — is expressed in various terms, each of which has become associated more or less definitely with a certain class of work. These terms may be divided into two groups — (1) those which represent a rate of flow, as "second-feet," "gallons per minute," "gallons per 24 hours," "miner's inches" and "run-off in second-feet per square mile," and (2) those which represent the actual quantity of water, as "run-off in depth in inches," "million gallons," "cubic feet," and "acre-feet." The units used in this report are "second-feet," "second-feet per square mile," and "run-off depth in inches." They may be defined as follows:

"Second-foot" is an abbreviation for cubic foot per second and represents the rate of discharge of water flowing in a channel one square foot in cross-section at a rate of one foot per second. It is generally adopted as the fundamental unit in the measurement of flowing water and is the "natural" unit, as the foot and second are the units used in making the physical determinations. Other units may be computed from this by the use of factors given in the table of equivalents.

"Second-feet per square mile" is the average number of cubic feet of water flowing per second from each square mile of area drained, on the assumption that the run-off is distributed uniformly both as regards time and area.

"Run-off depth in inches" is the depth to which the drainage area would be covered if all the water flowing from it in a given period were conserved and uniformly distributed over the surface. It is used for comparing run-off with rainfall, which is usually expressed as depth in inches.

CONVENIENT EQUIVALENTS

The following is a list of convenient equivalents for use in hydraulic computations:

Table for converting discharge in second-feet per square mile into run-off in depth in inches over the area

SEC.-FT. PER Sq. MI.	DEPTH IN INCHES FOR PERIODS INDICATED							Sec.-ft. per sq. mi.
	1 day	28 days	29 days	30 days	31 days	365 days	366 days	
1.....	0.037190	1.041322	1.078512	1.115702	1.152893	13.574380	13.611570	1
2.....	.074380	2.082645	2.157025	2.231405	2.305785	27.148760	27.223140	2
3.....	.111570	3.123967	3.235537	3.347107	3.458678	40.723140	40.834711	3
4.....	.148760	4.165289	4.314050	4.462810	4.611570	54.297521	54.446281	4
5.....	.185950	5.206612	5.392562	5.578512	5.764463	67.871901	68.057851	5
6.....	.223140	6.247934	6.471074	6.694215	6.917355	81.446281	81.669421	6
7.....	.260331	7.289256	7.549587	7.809917	8.070248	95.020661	95.280992	7
8.....	.297521	8.330579	8.628099	8.925620	9.223140	108.595041	108.892562	8
9.....	.334711	9.371901	9.706612	10.041322	10.376033	122.169421	122.504132	9

NOTE.— For partial month, multiply the values for one day by the number of days.

1 second-foot equals 7.49 United States gallons per second; equals 448.8 gallons per minute; equals 646,317 gallons for one day.

1 second-foot for one year covers 1 square mile 1.131 feet, or 13.572 inches, deep.

1 second-foot for one year equals 31,536,000 cubic feet.

1 second-foot for one day equals 86,400 cubic feet.

1,000,000,000 (1 United States billion) cubic feet equals 11,570 second-feet for 1 day.

1,000,000,000 cubic feet equals 414 second-feet for one 28-day month.

1,000,000,000 cubic feet equals 399 second-feet for one 29-day month.

1,000,000,000 cubic feet equals 386 second-feet for one 30-day month.

1,000,000,000 cubic feet equals 373 second-feet for one 31-day month.

1,000,000 United States gallons per day equals 1.55 second-feet.

100 United States gallons per minute equals 0.223 second-foot.

1 inch deep on 1 square mile equals 2,323,200 cubic feet.

1 inch deep on 1 square mile equals 0.0737 second-foot per year.

1 foot equals 0.3048 meter.

1 mile equals 1.60935 kilometers.

1 mile equals 5,280 feet.

1 acre equals 0.4047 hectare.

1 acre equals 43,560 square feet.

1 acre equals 209 feet square, nearly.

1 square mile equals 2.59 square kilometers.

1 cubic foot equals 0.0283 cubic meter.

1 cubic foot of water weighs 62.5 pounds.

1 cubic meter per minute equals 0.5886 second-foot.

1 horse-power equals 550 foot-pounds per second.

1 horse-power equals 76.0 kilogram-meters per second.

1 horse-power equals 746 watts.

1 horse-power equals 1 second-foot falling 8.80 feet.

$1\frac{1}{3}$ horse-power equals about 1 kilowatt.

To calculate water-power quickly: $\frac{\text{Sec.-ft.} \times \text{fall in feet}}{11} = \text{net horse-power on water-wheel realizing 80 per cent of theoretical power.}$

ST. LAWRENCE RIVER DRAINAGE BASIN

GENERAL FEATURES

St. Lawrence river receives the flow of a number of New York streams having their sources in a northerly slope of the Adirondacks and fed by the numerous lakes with which the region is dotted. Some of these rivers, as the Grass, Raquette and St. Regis, lie entirely within the United States; others, notably Salmon, Trout, Chateaugay and English rivers, cross the international boundary and flow northward into the St. Lawrence in Canada, as does also Richelieu river, the outlet of Lake Champlain. The following table gives a list of the principal tributaries of the St. Lawrence in the United States, with the areas drained by them:

Drainage areas of St. LAWRENCE RIVER TRIBUTARIES in the United States

	Square miles		Square miles
Oswegatchie river.....	1,609	Salmon river <i>a</i>	273
Grass river.....	637	Trout river <i>b</i>	129
Raquette river.....	1,219	Chateaugay river <i>b</i>	199
St. Regis river.....	910	English river <i>b</i>	53
Little Salmon river <i>a</i>	103	Lake Champlain <i>c</i>	7,867

a Above junction near international boundary. *b* At New York State line. *c* Above outlet.

The northwestern part of New York State is tributary to the St. Lawrence river system through Lake Ontario, Niagara river and Lake Erie.

CATTARAUGUS CREEK

DESCRIPTION

Cattaraugus creek rises in the southwestern part of Wyoming county and flows in a westerly direction, entering Lake Erie about 25 miles southwest of Buffalo. The stream is about 55 miles long and drains an area of approximately 560 square miles above the mouth. Its headwaters rise at an elevation of between 1,900 and 2,000 feet. The drainage basin is hilly, fairly well timbered and rather narrow. There are few tributary streams, those of most importance entering the river from the south.

South branch of Cattaraugus creek, which is the largest tributary, enters at a point about two miles above Gowanda. There is a dam at Gowanda, which is used for developing electric power and also for running a grist-mill.

CATTARAUGUS CREEK AT VERSAILLES

Location.—At the three-span highway bridge in Versailles, Cattaraugus county, $21\frac{1}{4}$ miles above mouth of Clear creek, about 6 miles below Gowanda and about 8 miles above mouth of stream.

Drainage area.—467 square miles (measured on post-route map).

Records available.—September 23, 1910, to June 30, 1921.

Gage.—Chain on upstream side of right span of bridge, read by Charles Wilson.

Discharge measurements.—Made from downstream side of bridge or by wading.

Channel and control.—Bed composed of rocks and gravel; shifting.

Extremes of discharge.—Maximum stage recorded during year, 8.9 feet at 10 A. M., July 24 (discharge, 10,900 second-feet); minimum stage recorded, 4.75 feet at 8 A. M., October 25 (discharge, 90 second-feet).

1910–1921: Maximum open-water stage recorded, 11.6 feet at 5:40 P. M., March 25, 1913 (discharge, about 30,000 second-feet); minimum stage recorded, 4.35 feet several times in August, 1918 (discharge, about 49 second-feet).

Ice.—Stage-discharge relation affected by ice.

Accuracy.—Stage-discharge relation not permanent; affected by ice during much of the period December to March. Gage read to half-tenths twice daily. Daily discharge throughout year ascertained by indirect method, applying mean daily effective gage-height to rating table; corrections for obtaining effective gage heights determined from discharge measurements. Records fair.

Coöperation.—Station maintained by the United States Geological Survey in coöperation with the State Engineer and Surveyor.

Discharge measurements of CATTARAUGUS CREEK AT VERSAILLES, during the year
ending June 30, 1921

DATE	Made by	Gage height	Dis-charge
		<i>Feet</i>	<i>Sec.-feet</i>
July 1.....	Otto Lauterhahn.....	5.02	256
July 23.....	Otto Lauterhahn.....	5.01	258
July 23.....	Otto Lauterhahn.....	4.99	250
Aug. 14.....	Otto Lauterhahn.....	5.00	208
Aug. 14.....	Otto Lauterhahn.....	5.00	214
Oct. 25.....	Otto Lauterhahn.....	4.81	112
Oct. 25.....	Otto Lauterhahn.....	4.81	109
Dec. 17.....	Otto Lauterhahn.....	5.50	732
Dec. 17.....	Otto Lauterhahn.....	5.50	709
Jan. 22.....	Otto Lauterhahn.....	a 6.82	3,570
Jan. 31.....	Otto Lauterhahn.....	a 6.05	496
Feb. 8.....	Otto Lauterhahn.....	a 5.40	561
Feb. 8.....	Otto Lauterhahn.....	a 5.40	561
Mar. 17.....	Otto Lauterhahn.....	5.62	827
Mar. 17.....	Otto Lauterhahn.....	5.61	805
June 6.....	Lauterhahn and Howe.....	5.07	167
June 6.....	Lauterhahn and Howe.....	5.06	164

a Backwater from ice.

Daily discharge, in second-feet, of CATTARAUGUS CREEK AT VERSAILLES, for the year
ending June 30, 1921

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	278	223	161	800	140	550	800	380	550	1,400	850	220
2.....	180	195	120	750	170	1,900	4,800	500	800	950	750	220
3.....	217	195	135	440	300	1,200	1,600	440	2,200	750	650	200
4.....	152	195	124	260	340	500	1,200	440	950	650	550	180
5.....	143	189	120	220	240	750	1,200	420	800	550	480	180
6.....	143	175	152	190	220	1,400	1,100	800	3,000	500	440	160
7.....	180	171	258	150	180	1,000	850	600	4,200	500	400	160
8.....	522	171	223	180	190	750	1,200	550	4,600	480	380	160
9.....	680	171	139	180	160	550	1,100	650	3,200	1,400	360	160
10.....	356	252	139	170	200	500	700	750	1,900	900	340	160
11.....	265	371	161	170	220	500	700	550	1,200	650	320	160
12.....	195	271	532	170	220	480	650	500	1,000	550	280	240
13.....	195	211	363	170	220	600	600	480	1,200	500	320	200
14.....	171	211	245	140	180	3,600	600	480	1,000	480	320	170
15.....	184	258	200	140	200	1,400	600	500	850	550	280	160
16.....	157	200	189	140	180	850	500	3,800	1,000	500	280	150
17.....	148	217	189	100	200	750	440	3,800	800	1,600	280	170
18.....	184	258	132	140	600	650	240	1,200	1,000	1,200	280	180
19.....	503	200	152	140	380	600	440	850	1,800	950	260	150
20.....	465	184	152	140	600	600	380	750	750	650	240	140
21.....	304	166	132	120	1,400	600	700	550	800	850	240	140
22.....	239	200	132	110	4,000	650	3,200	550	750	1,200	240	140
23.....	239	200	120	100	2,400	2,800	2,200	550	650	1,000	650	130
24.....	6,170	171	113	120	1,800	1,900	950	550	550	950	360	130
25.....	1,450	161	113	100	1,400	850	700	500	650	650	700	130
26.....	636	152	113	120	1,000	850	700	700	650	550	550	130
27.....	439	139	113	140	800	850	550	600	600	500	340	160
28.....	340	128	113	170	700	800	480	650	2,400	460	300	460
29.....	318	139	132	200	700	650	380	.....	1,500	2,400	320	320
30.....	271	152	161	180	600	700	320	.....	1,100	1,200	260	460
31.....	223	161	.....	170	.....	650	320	.....	1,000	.....	240	.....

NOTE.— Discharge, January 8 to February 15, determined from gage-heights corrected for ice affect from 4 discharge measurements, comparison with record of Allegheny River at Red House and study of gage-height graph and weather records.

Monthly discharge of CATTARAUGUS CREEK, AT VERSAILLES, for the year ending June 30, 1921

Drainage area 467 square miles

MONTH	DISCHARGE IN SECOND-FEET				RUN-OFF
	Maximum	Minimum	Mean	Per square mile	Depth in inches on drainage area
July.....	6,170	143	514	1.10	1.27
August.....	371	128	196	.420	.48
September.....	532	113	171	.366	.41
October.....	800	100	204	.437	.50
November.....	4,000	140	665	1.42	1.58
December.....	3,600	480	991	2.12	2.44
January.....	4,800	240	974	2.09	2.41
February.....	3,800	380	825	1.77	1.84
March.....	4,600	550	1,370	2.93	3.38
April.....	2,400	460	848	1.82	2.03
May.....	850	240	395	.846	.98
June.....	460	130	191	.409	.46
The year.....	6,170	100	612	1.31	17.78

TONAWANDA CREEK

DESCRIPTION

Tonawanda creek rises in Wyoming county and flows northward into Genesee county. At Batavia it turns abruptly to the west and continues in that direction until it reaches the Niagara river at Tonawanda.

Tonawanda creek rises in a rather hilly country and, in the upper part of its basin, flows through a rather narrow valley. Its main tributary is Little Tonawanda creek, which flows into the stream from the right about 3 miles south of Batavia.

Between Pendleton and Tonawanda the creek and the Barge canal are coincident. Water for canal purposes is passed eastward in the canal from Tonawanda creek and Niagara river.

TONAWANDA CREEK AT TONAWANDA

Gage No. 221

Location.—At the New York Central railroad drawbridge, about 400 feet above the mouth of the creek.

Records available.—January 23, 1905, to June 30, 1921.

Gage.—Friez 7-day graph water-stage recorder on right bank, just below the railroad bridge. Inspected by employees of this Department.

Discharge.—No discharge obtained.

Accuracy.—Operation of recorder fairly satisfactory, elevation of water-surface taken from graph to tenths.

Coöperation.—Station established and maintained by this Department.

Daily elevation of water-surface (B. C. Datum) of NIAGARA RIVER AT TONAWANDA CREEK, TONAWANDA, for the year ended June 30, 1921

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	567.2	567.2	567.4	a	567.4	566.7	567.0	566.9	566.7	567.4	568.2	567.4
2.....	567.2	567.1	a	a	567.5	567.2	568.1	567.2	566.8	567.6	568.0	567.6
3.....	567.4	567.1	567.2	a	568.1	567.0	567.4	567.4	567.0	567.4	567.8	567.8
4.....	567.4	567.0	567.1	a	567.4	567.0	567.1	566.7	566.8	567.4	567.7	567.6
5.....	567.3	567.0	567.0	a	567.4	567.6	567.4	566.7	566.7	567.3	567.6	567.6
6.....	567.2	567.0	567.2	a	566.9	567.6	567.2	567.0	567.1	567.3	567.8	567.6
7.....	567.3	567.1	567.4	a	566.7	567.0	567.0	566.6	566.7	567.4	567.8	567.6
8.....	567.3	567.1	567.3	a	567.0	566.6	567.3	566.6	567.0	567.4	567.8	567.7
9.....	567.4	567.1	567.2	a	567.3	566.5	567.1	566.9	567.2	567.6	567.9	567.6
10.....	567.2	567.2	567.2	567.1	567.3	566.9	567.0	566.5	567.2	567.3	567.8	567.7
11.....	567.1	567.2	567.2	567.0	566.9	567.2	567.1	566.6	567.0	567.4	567.4	567.9
12.....	567.2	567.1	567.4	567.0	567.6	566.9	567.1	567.0	567.0	567.5	567.6	567.8
13.....	567.2	567.1	567.4	567.0	567.5	566.8	566.9	566.8	567.0	567.4	567.7	567.9
14.....	567.2	567.2	567.2	567.1	567.4	567.8	567.1	567.0	566.8	567.3	567.9	567.7
15.....	567.2	567.2	567.1	567.1	567.0	566.6	567.6	566.6	566.9	567.5	568.0	567.7
16.....	567.2	567.2	567.3	567.1	566.4	567.5	567.7	567.0	567.3	566.7	567.8	567.7
17.....	567.1	567.1	567.2	567.1	566.6	567.4	a	567.7	567.2	566.8	567.7	567.6
18.....	567.1	a	567.6	567.0	567.2	567.3	a	567.2	567.0	567.6	567.6	567.5
19.....	567.4	a	566.9	567.0	567.2	566.9	a	567.0	567.0	567.7	567.6	567.5
20.....	567.3	a	a	567.0	566.7	566.8	a	566.6	567.3	567.7	567.6	567.5
21.....	567.3	567.2	a	567.1	566.3	566.4	a	566.5	567.4	567.6	567.7	567.6
22.....	567.2	567.2	a	567.2	566.3	566.4	566.8	566.8	567.0	567.5	567.8	567.7
23.....	567.2	567.1	a	566.9	566.7	a	567.4	567.4	566.9	567.8	567.6	567.8
24.....	567.4	567.0	a	566.8	566.8	567.8	566.9	566.8	567.0	567.8	567.5	567.7
25.....	567.2	567.0	567.0	566.9	566.9	567.2	566.6	567.0	567.4	567.8	567.8	567.6
26.....	567.2	567.1	567.1	566.8	567.0	566.9	566.7	566.5	567.2	567.8	567.7	567.6
27.....	567.2	567.1	567.1	567.2	566.9	567.2	567.1	566.6	567.2	567.8	567.6	567.6
28.....	567.2	567.2	567.2	567.6	566.7	567.9	566.8	566.7	567.4	567.8	567.8	567.7
29.....	567.2	567.2	567.2	a	566.5	567.7	566.7	566.7	567.2	568.0	567.9	567.6
30.....	567.2	567.4	567.0	a	566.7	567.3	567.0	....	567.2	568.3	567.9	567.5
31.....	567.4	567.6	....	567.9	....	566.8	566.1	....	567.4	....	567.8	....

a No record.

LITTLE TONAWANDA CREEK AT LINDEN

Location.—At stone-arch highway bridge in Linden, Genesee county, 3 miles above junction with Tonawanda creek.

Drainage area.—22.0 square miles (measured on topographic maps).

Records available.—July 8, 1912, to June 30, 1921.

Gage.—Vertical staff on upstream side of right abutment; lower 2 feet of enameled iron, graduated to hundredths of a foot; upper 4 feet of bronze, graduated to half-tenths; read by C. L. Schenck.

Discharge measurements.—Made by wading near gage.

Channel and control.—The weir formerly in use was entirely destroyed by ice February 20, 1918. It was replaced September 18, 1920. The section of the channel which formed the control since the destruction of the weir is of coarse gravel and boulders and is probably permanent between dates of shift.

Extremes of discharge.—Maximum stage recorded during year, 8.88 feet at 6 P. M., February 16 (discharge, about 1,230 second-feet); minimum stage recorded, minus 0.48 foot, July 16 and 17 (discharge, 1.0 second-foot).

1912-1921: Maximum stage recorded, 9.0 feet at 6 P. M., May 10, 1919 (discharge, 2,500 second-feet); minimum discharge, 0.43 second-foot, August 20, 21, September 14-16 and October 8, 1913.

Ice.—Ice forms above weir, but control is kept free from ice by observer before reading gage.

Accuracy.—Rating curve used before replacement of weir fairly well defined below 150 second-feet. Curve used after installation of weir well defined below 800 second-feet. Gage read to hundredths twice daily. Daily discharge ascertained by applying mean daily gage-height to rating table. Records good except periods covered by estimate, which are fair.

Coöperation.—Station maintained by the United States Geological Survey in coöperation with the State Engineer and Surveyor.

Discharge measurements of LITTLE TONAWANDA CREEK AT LINDEN, during the year ending June 30, 1921

DATE	Made by	Gage height	Dis-charge
		<i>Feet</i>	<i>Sec.-feet</i>
July 22.....	Otto Lauterhahn.....	a- .40	2.64
July 22.....	Otto Lauterhahn.....	a- .40	2.46
Aug. 24.....	Lauterhahn and Covert.....	a- .36	3.77
Sept. 13.....	S. M. Currier.....	a- .34	4.23
Sept. 18.....	Otto Lauterhahn.....	.48	2.08
Sept. 19.....	Lamoureux and Lauterhahn.....	.47	2.15
Oct. 12.....	Lauterhahn and Covert.....	.79	5.68
Oct. 12.....	Lauterhahn and Covert.....	.79	5.08
Oct. 26.....	Otto Lauterhahn.....	.60	2.70
Oct. 26.....	Otto Lauterhahn.....	.60	2.80
Dec. 16.....	Otto Lauterhahn.....	1.25	25.8
Dec. 16.....	Otto Lauterhahn.....	1.25	26.4
Mar. 8.....	Otto Lauterhahn.....	3.84	267
Mar. 8.....	Otto Lauterhahn.....	3.74	260
Mar. 8.....	Otto Lauterhahn.....	3.55	235

a Gage is set with zero at crest of weir. All gage readings taken after weir was destroyed have minus sign and were below elevation of weir crest.

Daily discharge in second-feet, of LITTLE TONAWANDA CREEK AT LINDEN, for the year ending June 30, 1921

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	June
1.....	1.7	3.5	2.3	50	5.5	66	30	12	24	5.2
2.....	1.7	4.1	2.1	38	12	211	223	12	223	4.7
3.....	2.0	3.8	2.0	16	12	90	70	11	104	4.5
4.....	1.7	3.5	2.0	8.8	8.0	99	58	10	46	4.2
5.....	1.3	3.5	2.0	5.5	*6.5	86	43	14	37	3.8
6.....	1.3	2.9	3.5	6.0	6.0	58	37	22	261	3.5
7.....	2.0	2.6	3.5	5.5	5.5	37	32	18	199	3.3
8.....	1.7	2.1	3.5	5.2	5.2	30	58	17	360	3.1
9.....	1.5	5.0	2.9	4.7	5.5	23	30	20	154	2.9
10.....	1.3	16	2.3	4.5	5.8	21	19	24	90	2.7
11.....	1.3	6.3	5.8	4.0	5.5	20	19	24	58	2.6
12.....	1.3	4.7	10	5.3	5.2	20	15	17	43	2.4
13.....	1.3	4.1	....	4.8	5.3	30	14	17	50	2.4
14.....	1.2	12	....	4.5	5.2	74	18	18	40	2.2
15.....	1.2	5.8	....	3.8	4.8	40	14	16	37	2.0
16.....	1.0	5.3	....	3.6	4.5	27	12	468	78	2.0
17.....	1.0	6.3	....	3.5	5.3	27	11	154	39	2.4
18.....	5.3	4.7	2.2	3.2	5.2	23	24	66	50	2.3
19.....	16	4.1	2.0	3.1	7.2	22	12	58	36	1.9
20.....	4.7	4.1	2.2	3.3	19	20	19	30	86	1.8
21.....	2.9	3.8	2.3	3.1	25	16	82	22	43	1.7
22.....	2.1	4.7	2.2	2.9	37	22	99	24	32	1.7
23.....	2.0	4.4	2.2	2.9	104	104	82	19	29	1.5
24.....	204	3.5	2.0	2.8	74	40	32	12	26	1.5
25.....	36	3.2	2.2	2.8	50	24	24	14	30	1.5
26.....	14	2.9	2.2	3.0	40	24	28	14	25	1.4
27.....	8.9	2.9	2.0	3.6	37	28	16	18	23	1.3
28.....	6.3	2.3	2.2	4.2	35	23	12	20	74	1.7
29.....	5.0	2.3	2.2	4.5	37	25	13	....	43	6.0
30.....	4.1	2.3	3.5	4.5	35	26	22	....	40	2.1
31.....	3.5	2.3	....	4.2	....	22	14	....	37	....

NOTE — Discharge, September 13-17, estimated at 3.0 second-feet; weir in course of construction. Mean daily discharge, April 1-30 estimated at 35 second-feet and May 1-31 at 10 second-feet from comparison with records of Keshequa and Canaseraga Creeks; no gageheight record.

Monthly discharge of LITTLE TONAWANDA CREEK AT LINDEN, for the year ending June 30, 1921

Drainage area 22 square miles

MONTH	DISCHARGE IN SECOND-FEET				
	Maximum	Minimum	Mean	Per square mile	Depth in inches on drainage area
July.....	204	1.0	12.9	.587	.68
August.....	16	2.1	4.48	.204	.24
September.....	10	2.0	2.88	.131	.15
October.....	50	2.8	7.15	.325	.37
November.....	104	4.5	20.4	.927	1.03
December.....	211	16	44.5	2.02	2.33
January.....	223	11	38.1	1.73	1.99
February.....	468	10	41.8	1.90	1.98
March.....	360	23	78.0	3.55	4.09
April.....	.....	.....	35.0	1.59	1.77
May.....	.....	.....	10.0	.455	.52
June.....	6.0	1.3	2.68	.122	.14
The year.....	468	1.0	24.6	1.12	15.29

GENESEE RIVER DRAINAGE BASIN**GENESEE RIVER****DESCRIPTION**

Genesee river rises in Potter county, Pa., 8 or 10 miles south of the New York-Pennsylvania boundary, flows northwestward for about 32 miles, then turns to the northeast and empties into Lake Ontario, 7 miles north of Rochester. The entire length of the stream, following bends, is about 135 miles and the drainage area is about 2,450 square miles.

In the 39 miles between Belmont, in central Allegany county, and Portage, in southwestern Livingston county, the fall of the water-surface is 253 feet, an average of 6.4 feet per mile. At Portage the river plunges down in three magnificent falls and thence to Mount Morris flows at the bottom of a deep gorge. From Mount Morris to Rochester the valley is broad and open and the stream is bordered by meadows subject to occasional overflow. At Rochester there is another abrupt descent over three heavy falls, amounting to about 260 feet within the city.

In connection with the Barge canal improvement, the State has constructed a new dam across the Genesee river about 100 feet below the old Johnson and Seymour dam in the city of Rochester forming a pool in which the Barge canal crosses the river. It consists of a movable dam, 240 feet long, of the Boulé or Mohawk river type and two sector gates each 53 feet 11 inches long. The elevation of the creast of these gates when closed is 512.6, normal Barge canal water surface elevation in Genesee river. At either end of the dam are bulkhead gates to be used in connection with power development. The new pool is 9 feet higher than the crest of the old Johnson and Seymour dam, a portion of which has been left in place and so connected with the new construction that when the gates of the movable dam are lifted at the close of the navigation season the water surface may return to its former elevation, 503.6.

Water is diverted east from the Genesee river for operation of the Barge canal but this diversion is adequately compensated by diversion of Niagara river water into the Genesee river.

The Genesee river has been canalized from the point where the Barge canal crosses it south of Rochester to the new State dam, a distance of about 2.4 miles.

The average precipitation is about 35 inches per year, which is 3 inches below normal for the entire State.

Drainage areas of tributaries of GENESEE RIVER

NAME OF STREAM	AREA IN SQUARE MILES		
	Tributary	G ENESEE RIVER	
		Above tributary	Below tributary
Cryder creek	43.3	99.9	143.2
Chenunda creek	30.0	181.0	211.0
Dyke's creek	68.3	214.0	282.3
Vandermark creek	21.6	301.3	322.9
Knight's creek	22.3	323.9	346.2
Phillips creek	32.3	372.8	405.1
Vancampens creek	55.7	410.4	466.1
Angelica creek	82.1	481.1	563.2
White creek	15.9	569.2	585.1
Black creek (Allegany county)	31.1	595.5	626.6
Crawford creek	11.8	637.6	649.4
Canadea creek	63.3	651.0	714.3
Cold creek	41.0	745.3	786.3
Rush creek	35.3	787.0	822.3
Wisoy creek (including East Koy creek)	108.6	833.6	942.2
East Koy creek	59.9		
Wolf creek	19.3	974.9	994.2
Silver lake outlet	30.4	1,029.2	1,059.6
Canaseraga creek, Livingston Co. (including Keshequa creek)	340.7	1,066.4	1,407.1
Keshequa creek (formerly Coshqua)	82.0		
Beards creek	41.3	1,423.1	1,464.4
Conesus lake outlet	88.8	1,555.5	1,643.9
Honeoye creek	262.6	1,675.9	1,938.5
Allen's creek	198.1	1,947.1	2,145.2
Black creek (Monroe county)	211.8	2,168.5	2,380.0
Genesee river, total at mouth			2,445.6

GENESEE RIVER AT SCIO

Location.—At steel highway bridge $\frac{1}{4}$ mile above Vandermark creek, $\frac{1}{2}$ mile above Scio, Allegany county, and 1 mile above Knight creek.

Drainage area.—288 square miles (measured on map issued by United States Geological Survey; scale, 1:500,000).

Records available.—June 12, 1916, to June 30, 1921.

Gage.—Vertical staff attached to downstream face of left bridge abutment; read by Mrs. Margaret Potter.

Discharge measurements.—Made from downstream side of bridge or by wading.

Channel and control.—Coarse gravel; practically permanent.

Extremes of discharge.—Maximum stage recorded during year, 5.1 feet at 8:30 A. M., February 17 (discharge, 3,810 second-feet); minimum stage recorded, 0.32 foot, morning and evening, June 26 and 27 (discharge, 29 second-feet); discharge of 28 second-feet, September 20, 23 and 24, corresponding to a gage height of 0.34 foot).

1916-1921: Maximum stage recorded, 9.1 feet at noon, May 22, 1919 (discharge, 10,600 second-feet); minimum discharge, 25 second feet, August 25, 26, 1916, July 20 and October 2-4, 1919.

Ice.—Stage-discharge relation affected by ice.

Accuracy.—Stage-discharge relation changed during the high water of July. Rating curve used before this time well defined between 50 and 5,500 second-feet. After this change, rating curve well defined between 20 and 2,000 second-feet; affected by ice most of January and February. Gage read to hundredths twice daily. Daily discharge ascertained by applying mean daily gage height to rating table. Open-water records good; winter records fair.

Coöperation.—Station maintained by the United States Geological Survey in coöperation with the State Engineer and Surveyor.

Discharge measurements of GENESEE RIVER AT SCIO, during the year ending June 30, 1921

DATE	Made by	Gage height	Discharge
		<i>Feet</i>	<i>Sec.-ft.</i>
Sept. 11.....	Currier and Lamoureux.....	0.39	34.2
Oct. 2.....	Otto Lauterhahn.....	1.36	308
Oct. 29.....	Otto Lauterhahn.....	.58	69.2
Oct. 29.....	Otto Lauterhahn.....	.58	67.3
Jan. 29.....	Otto Lauterhahn.....	a 1.18	110
Feb. 7.....	Otto Lauterhahn.....	a 1.11	125
Feb. 24.....	Otto Lauterhahn.....	a 1.16	199
Feb. 24.....	Otto Lauterhahn.....	a 1.16	214
Mar. 16.....	Otto Lauterhahn.....	2.31	840
June 8.....	B. F. Howe.....	.69	92.1

a Backwater from ice.

Daily discharge in second-feet of GENESEE RIVER AT SCIO, for the year ending June 30, 1921

DAY	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....		700	50	510	189	100	410	700	700	200
2.....		510	50	1,040	385	110	410	562	672	144
3.....		236	90	790	349	160	1,290	485	618	141
4.....		144	77	680	287	120	672	460	535	.....
5.....		130	66	590	283	130	535	385	562	.....
6.....		121	56	535	304	150	1,120	362	460	.....
7.....		113	52	435	221	140	2,640	331	385	.....
8.....		105	54	376	313	130	1,760	291	376	.....
9.....		98	52	318	247	85	2,070	435	313	.....
10.....		77	70	300	192	100	1,470	376	271	.....
11.....		72	72	275	206	140	960	322	247	.....
12.....		75	72	259	190	140	855	291	236	.....
13.....	188	68	68	255	180	150	1,560	279	240	88
14.....	88	62	62	890	160	120	925	259	179	79
15.....	69	58	52	672	150	120	820	275	169	72
16.....	61	54	54	510	160	320	790	244	153	66
17.....	51	52	118	435	170	2,800	618	283	172	60
18.....	36	52	100	410	170	900	590	287	160	56
19.....	32	52	88	336	160	500	485	259	150	52
20.....	29	49	150	318	160	440	645	236	130	49
21.....	33	49	340	287	500	380	618	240	111	44
22.....	30	46	1,040	251	480	320	562	228	100	.....
23.....	28	43	960	410	360	260	460	1,040	214	.....
24.....	28	43	890	331	240	220	435	760	156	.....
25.....	33	42	700	300	130	180	535	535	200	31

Daily discharge in second-feet of GENESEE RIVER AT SCIO, for the year ending June 30, 1921 — Continued

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
26.....			30	58	590	283	130	170	460	460	232	29
27.....			55	74	485	308	130	180	435	820	166	29
28.....			88	77	460	247	130	410	460	535	144	251
29.....			69	68	410	200	110	....	485	590	300	127
30.....			200	64	362	196	95	....	435	700	400	113
31.....			58	....	203	100	....	460	....	179	....

NOTE.—Discharge, Jan. 12–Feb. 27, determined from gage-heights corrected for ice effect from four discharge measurements, study of weather records and comparison with records at other stations. Discharge for following periods when gage was not read, estimated from hydrographs: July 1–31, 460 second-feet; Aug. 1–31, 200 second-feet; Sept. 1–11, 60 second-feet; June 4–12, 75 second-feet; June 22–24, 38 second-feet; Sept. 26, 27, 30, Oct. 26, Nov. 10, Dec. 4, 25, April 30, May 22, 30, estimated as shown in table.

Monthly discharge of GENESEE RIVER AT SCIO, for the year ending June 30, 1921
(Drainage area, 288 square miles)

MONTH	DISCHARGE IN SECOND-FEET				RUN-OFF Depth in inches on drainage area
	Maximum	Minimum	Mean	Per square mile	
July.....	....	....	460	1.60	1.84
August.....	....	....	200	.695	.80
September.....	200	28	62.8	.218	.24
October.....	700	42	111	.385	.44
November.....	1,040	50	256	.889	.99
December.....	1,040	196	418	1.45	1.67
January.....	500	95	222	.771	.89
February.....	2,800	85	321	1.11	1.16
March.....	2,640	410	838	2.91	3.36
April.....	1,040	228	434	1.51	1.68
May.....	700	100	288	1.00	1.15
June.....	251	29	80.7	.280	.31
The year.....	2,800	28	309	1.07	14.53

GENESEE RIVER AT ST. HELENA

Location.—At steel highway bridge in St. Helena, Wyoming county, 5½ miles below Portageville and site of proposed storage dam of New York Conservation Commission, and 9½ miles above mouth of Canaseraga creek.

Drainage area.—992 square miles.

Records available.—August 14, 1908, to June 30, 1921.

Gage.—Stevens continuous water-stage recorder on left bank just below bridge, installed September 28, 1917, and a chain gage on upstream side of the bridge, installed August 14, 1908. Automatic gage installed primarily to define fluctuations in medium and high stages; at gage height 3.3 feet an auxiliary inlet becomes operative. Below this stage chain gage heights are used. Water-stage recorder inspected and chain gage read by Herman Piper.

Discharge measurements.—Made from bridge or by wading.

Channel and control.—Gravel and rocks; shifting occasionally.

Extremes of discharge.—Maximum stage during year from water-stage recorder, 10.47 feet at 11 A. M., July 24 (discharge, 24,300 second-feet); minimum stage recorded (chain gage), 2.15 feet at 8 A. M., June 24 (discharge, 30 second-feet).

1908–1921: Maximum stage from water-stage recorder, 12.81 feet at 8 A. M., May 17, 1916 (discharge, 43,500 second-feet); minimum stage recorded, 1.70 feet at 5 P. M., October 5 and 8 A. M., October 17, 1913 (discharge, about 18 second-feet).

Ice.—Stage-discharge relation seriously affected by ice.

Accuracy.—Stage-discharge relation changed at time of high water, July 24. Chain gage rating curve used before this time fairly well defined between 100 and 30,000 second-feet; after this change, fairly well defined between 50 and 4,000 second-feet. Automatic gage rating curve used before this time very well defined between 150 and 40,000 second-feet; after this change, between 500 and 30,000 second-feet. The chain gage rating was revised below gage height 2.6 feet, as defined by discharge measurements, and this curve was used from October 1 to June 30. Gage heights above 3.3 feet taken from recorder; below 3.3 feet from chain gage. Daily discharge ascertained by applying mean daily gage height to proper rating table, except for days of great range in stage, when it is determined by averaging hourly discharge. Records, fair.

Coöperation.—Station maintained by the United States Geological Survey in coöperation with the State Engineer and Surveyor.

Discharge measurements of GENESEE RIVER AT ST. HELENA, during the year ending
June 30, 1921

DATE	Made by	Gage height	Discharge
		Feet	Sec.-ft.
July 22.....	Otto Lauterhahn.....	3.00	376
Aug. 10.....	Otto Lauterhahn.....	2.83	324
Aug. 25.....	Covert and Lauterhahn.....	2.74	253
Sept. 12.....	Lauterhahn and Lamoureux.....	3.68	1,180
Sept. 23.....	Lauterhahn and Lamoureux.....	2.29	55.8
Oct. 12.....	Lauterhahn and Covert.....	2.74	256
Oct. 27.....	Otto Lauterhahn.....	2.60	198
Oct. 27.....	Otto Lauterhahn.....	2.65	211
Dec. 15.....	Otto Lauterhahn.....	5.16	3,210
Dec. 15.....	Otto Lauterhahn.....	4.96	2,700
Jan. 3.....	Otto Lauterhahn.....	4.85	2,680
Jan. 20.....	Otto Lauterhahn.....	a 3.07	343
Feb. 1.....	Otto Lauterhahn.....	a 4.18	354
Feb. 21.....	Otto Lauterhahn.....	3.32	816
Feb. 21.....	Otto Lauterhahn.....	3.47	981
Mar. 18.....	Otto Lauterhahn.....	4.15	1,580
June 3.....	B. F. Howe.....	2.91	390

a Backwater from ice.

Daily discharge, in second-feet, of GENESEE RIVER at ST. HELENA, for the year ending June 30, 1921

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	193	377	212	3,330	222	1,250	680	280	1,280	2,500	1,510	481
2.....	312	384	114	1,880	233	3,530	2,300	220	1,390	2,060	1,750	520
3.....	203	330	82	1,060	195	3,300	3,070	240	6,220	1,570	1,450	357
4.....	193	292	135	680	256	2,280	1,570	340	3,600	1,300	1,170	317
5.....	157	292	201	520	280	1,880	1,390	320	1,880	1,100	1,060	256
6.....	215	268	91	428	239	1,940	1,450	380	5,210	1,000	960	233
7.....	226	232	133	357	201	1,690	1,060	360	9,350	815	880	201
8.....	215	195	190	317	185	1,350	960	240	7,090	680	1,060	181
9.....	325	190	136	304	212	1,050	1,280	180	6,950	1,420	815	195
10.....	293	304	167	250	233	770	860	300	5,650	1,420	680	195
11.....	255	428	61	256	233	815	960	240	3,160	1,100	600	233
12.....	193	357	798	268	292	680	680	170	2,440	860	520	256
13.....	209	292	560	233	250	770	481	200	3,420	680	520	311
14.....	162	250	481	233	201	2,430	300	320	2,540	680	520	256
15.....	162	871	406	212	222	3,110	170	550	2,150	680	442	212
16.....	183	640	280	217	233	1,750	190	1,500	2,150	600	428	217
17.....	119	520	233	190	292	1,350	200	11,700	1,940	1,900	337	222
18.....	144	1,410	181	166	256	1,100	220	3,620	1,690	1,880	330	171
19.....	1,520	1,000	136	190	317	950	240	1,940	1,510	1,570	292	171
20.....	967	520	181	166	520	815	320	1,570	1,400	1,200	274	166
21.....	540	406	195	143	1,170	600	600	860	1,820	1,220	268	127
22.....	381	317	100	123	3,960	520	2,010	860	1,630	1,400	250	123
23.....	395	292	114	96	6,250	1,620	1,880	860	1,350	2,490	428	103
24.....	17,400	233	114	152	4,550	2,150	1,150	560	1,200	3,940	481	76
25.....	5,440	195	114	135	2,930	800	240	520	1,250	2,040	481	96
26.....	2,230	217	72	135	2,290	480	300	520	1,400	1,510	910	96
27.....	1,360	153	121	152	1,880	750	200	600	1,400	1,410	640	201
28.....	950	136	136	166	1,630	600	280	680	1,950	1,380	442	181
29.....	680	181	114	233	1,570	500	200	.....	2,420	1,570	960	725
30.....	520	125	745	222	1,400	700	280	.....	1,980	1,880	1,050	600
31.....	481	172	.....	233	.....	680	180	.....	1,630	.....	680	.....

NOTE.— Discharge, Dec. 25-30, Jan. 2, 14-21, 25 — Feb. 16, determined from gage-heights corrected for ice effect from two discharge measurements, study of weather records and comparison with other records in same drainage. Discharge for following periods when stage was below 3.3 feet or when recorder was not in operation, determined from chain gage readings: July 1-18, 21-23, 29 — Aug. 14, 16, 17, 20 — Sept. 11, 13-29, Oct. 4 — Nov. 21, Dec. 10-13, 20-22, 26, 28 — Jan. 1, 4-21, 25 — Feb. 15, 21-28, Mar. 1-5, April 7, 8, 12-16, 29 — May 29, 31 — June 30.

Monthly discharge of GENESEE RIVER at ST. HELENA, for the year ending June 30, 1921

[Drainage area, 992 square miles.]

MONTH	DISCHARGE IN SECOND-FEET				RUN-OFF Depth in inches on drainage area
	Maximum	Minimum	Mean	Per square mile	
July.....	17,400	119	1,180	1.19	1.37
August.....	1,410	125	374	.377	.43
September.....	798	61	220	.222	.25
October.....	3,330	96	421	.424	.49
November.....	6,250	185	1,090	1.10	1.23
December.....	3,530	480	1,360	1.37	1.58
January.....	3,070	170	829	.836	.96
February.....	11,700	170	1,080	1.09	1.14
March.....	9,350	1,200	2,880	2.90	3.34
April.....	3,940	600	1,460	1.47	1.64
May.....	1,750	250	715	.721	.83
June.....	725	75	249	.251	.28
The year.....	17,400	61	990	.998	13.54

GENESEE RIVER AT JONES BRIDGE, NEAR MOUNT MORRIS

Location.—At highway bridge known as Jones bridge, $1\frac{1}{2}$ miles below Canaseraga creek, $1\frac{3}{4}$ miles above mouth of Beads creek, 5 miles below Mount Morris, Livingston county, and 6 miles by river above Geneseo.

Drainage area.—1,400 square miles.

Records available.—May 22, 1903, to April 30, 1906; August 12, 1908, to December 31, 1913; July 12, 1915, to June 30, 1921.

Gage.—Gurley 7-day water-stage recorder installed September 11, 1915, on right bank 60 feet downstream from bridge. Prior to 1915 a chain gage fastened to upstream side of highway bridge was used. Datum of water-stage recorder, 2.73 feet higher than that of chain gage (540.00 feet Conservation Commission datum). Recorder inspected by Theron S. Trewer.

Discharge measurements.—Made from footbridge erected on lower chord of upstream bridge truss.

Channel and control.—Sandy clay; fairly permanent in recent years.

Extremes of discharge.—Maximum stage during year from water-stage recorder, 22.90 feet at 8 A. M., July 24 (discharge, 20,700 second-feet); minimum stage from water-stage recorder, 0.67 foot at 3 A. M., September 23 (discharge, 100 second-feet).

1902–1921: Maximum stage recorded, 25.44 feet at noon, May 17, 1916 (discharge, 55,100 second-feet); minimum stage recorded, 2.7 feet at 6 P. M., August 29, 1909 (discharge, about 18 second-feet). See paragraph headed "Records Available" for limits of periods of no records.

Ice.—Stage-discharge relation affected by ice.

Regulation.—Some diurnal fluctuation due to operation of mills at Mount Morris is observable during extremely low water.

Accuracy.—Stage-discharge relation practically permanent, except as affected by ice during most of January and February. Previous rating curve revised below gage height 1.00 foot as defined by discharge measurements and is very well defined between 75 and 7,000 second-feet and fairly well defined between 7,000 and 60,000 second-feet. This new curve was used from October 1 to June 30. The previous rating curve was well defined between 150 and 7,000 second-feet and fairly well defined between 7,000 and 60,000 second-feet. Operation of water-stage recorder satisfactory throughout year. Daily discharge ascertained by applying to rating table mean daily gage height obtained by inspecting recorder graph or, for days of considerable fluctuation, by averaging discharge for intervals of the day. Open water records, good; winter records, fair.

Coöperation.—Station maintained by the United States Geological Survey in coöperation with the State Engineer and Surveyor.

Discharge measurements of GENESEE RIVER AT JONES BRIDGE NEAR MOUNT MORRIS, during the year ending June 30, 1921

DATE	Made by	Gage height	Discharge
		<i>Feet</i>	<i>Sec.-ft.</i>
July 15.....	Otto Lauterhahn.....	1.26	258
July 25.....	Otto Lauterhahn.....	15.16	8,480
Sept. 23.....	Lamoureux and Lauterhahn.....	1.06	189
Jan. 26.....	Otto Lauterhahn.....	a 5.12	362
Feb. 4.....	Otto Lauterhahn.....	a 3.24	481
Feb. 16.....	Otto Lauterhahn.....	a 2.47	777
Feb. 19.....	Otto Lauterhahn.....	a 6.34	2,750
Feb. 19.....	Otto Lauterhahn.....	5.96	2,920
Mar. 5.....	Otto Lauterhahn.....	5.55	2,630
May 31.....	Otto Lauterhahn.....	2.54	823

a Backwater from ice.

Daily discharge, in second-feet, of GENESEE RIVER AT JONES BRIDGE, NEAR MOUNT MORRIS, for the year ending June 30, 1921

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	238	665	219	3,520	288	1,540	1,700	400	1,440	2,960	2,020	690
2.....	268	615	216	2,740	291	4,590	3,140	490	2,170	2,750	1,960	690
3.....	291	565	192	1,420	298	4,840	4,200	500	6,660	2,220	1,900	545
4.....	261	506	235	920	353	2,960	2,280	500	4,720	1,840	1,600	438
5.....	248	457	213	690	361	2,410	1,900	440	2,680	1,600	1,420	377
6.....	258	407	207	565	302	2,340	1,960	750	4,440	1,420	1,280	345
7.....	274	369	232	492	258	2,020	1,420	650	12,300	1,300	1,220	330
8.....	271	334	238	434	271	1,660	1,540	600	11,800	1,220	1,140	295
9.....	268	319	258	381	271	1,300	1,900	550	10,500	1,480	1,080	268
10.....	407	341	261	337	271	1,140	1,300	750	10,100	1,900	920	261
11.....	373	555	207	323	278	1,060	1,080	600	5,130	1,540	840	254
12.....	316	550	381	312	323	948	1,000	550	3,530	1,280	765	323
13.....	274	457	892	316	316	920	840	500	3,900	1,170	740	361
14.....	254	615	525	298	274	2,000	650	550	4,060	1,080	740	345
15.....	254	975	457	298	291	3,760	480	600	3,030	1,030	715	319
16.....	245	1,000	357	298	291	2,150	300	2,350	2,820	1,030	640	302
17.....	241	790	312	214	305	1,540	300	14,800	2,610	1,650	590	288
18.....	210	1,450	268	219	312	1,300	300	8,390	2,220	2,960	545	261
19.....	1,380	1,170	190	288	390	1,110	400	3,100	2,080	2,280	506	222
20.....	1,520	765	198	268	492	1,140	650	2,150	1,900	1,480	479	207
21.....	815	530	216	210	812	1,060	1,000	1,600	2,150	1,420	438	198
22.....	560	461	201	213	3,920	1,110	3,000	1,330	2,150	1,780	403	184
23.....	506	430	166	192	8,180	1,500	3,000	1,220	1,900	2,290	470	173
24.....	14,500	381	181	187	6,670	2,750	1,400	1,060	1,660	5,800	615	164
25.....	14,300	334	178	222	3,830	1,500	1,200	948	1,900	3,100	640	154
26.....	5,110	305	165	235	2,820	1,100	480	1,030	1,720	2,080	815	148
27.....	2,540	278	182	238	2,340	1,000	320	920	1,840	1,720	840	353
28.....	1,660	254	209	243	2,020	1,000	340	1,080	2,060	1,780	665	271
29.....	1,110	226	222	238	1,960	900	440	.....	3,240	1,660	790	264
30.....	865	213	307	251	1,720	1,000	320	.....	2,610	2,150	1,170	615
31.....	740	226	.....	226	.....	1,000	400	.....	2,150	.....	865	.....

NOTE.—Discharge, Dec. 25-Jan. 1 and Jan. 14-Feb. 15 determined from gage-heights corrected for ice effect from 4 discharge measurements, study of weather records, etc. Discharge determined from gage-heights estimated from recorder graph May 28, 29, June 9-11, 15-30.

Monthly discharge of GENESEE RIVER AT JONES BRIDGE NEAR MOUNT MORRIS, for
the year ending June 30, 1921
[Drainage area, 1,400 square miles]

MONTH	DISCHARGE IN SECOND-FEET				RUN-OFF
	Maximum	Minimum	Mean	Per square mile	Depth in inches on drainage area
July.....	14,500	210	1,630	1.16	1.34
August.....	1,450	213	534	.381	.44
September.....	892	165	270	.193	.22
October.....	3,250	187	542	.387	.45
November.....	8,180	258	1,350	.964	1.08
December.....	4,840	900	1,760	1.26	1.45
January.....	4,200	300	1,270	.907	1.05
February.....	14,800	400	1,730	1.24	1.29
March.....	12,300	1,440	3,920	2.80	3.23
April.....	5,800	1,030	1,940	1.39	1.55
May.....	2,020	403	929	.664	.77
June.....	690	148	322	.230	.26
The year.....	14,800	148	1,350	.964	13.13

GENESEE RIVER AT GENESEE JUNCTION

Gage No. 227

Location.—At mouth of Black creek, just above the West Shore railroad bridge across the Genesee river and about $5\frac{1}{2}$ miles above the city of Rochester.

Records available.—June 11, 1917, to June 30, 1921.

Gage.—Staff on the east wing of the north abutment of the Scottsville highway bridge over Black creek; read by J. H. Begy.

Discharge.—No discharge obtained.

Accuracy.—Gage read once daily to half-tenths.

Coöperation.—Station established and maintained by this Department.

Daily elevation of water-surface (B. C. Datum) of GENESEE RIVER ABOVE W. S. R. R.
BRIDGE AT GENESEE JUNCTION, for the year ended June 30, 1921

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	512.60	512.90	512.80	512.75	512.55	513.00	510.00	510.00	510.60	510.40	513.00	512.70
2.....	512.55	512.90	512.80	512.75	512.60	513.40	512.20	510.20	510.00	511.20	513.00	512.60
3.....	512.55	512.90	512.70	512.75	512.55	513.40	513.00	510.20	513.55	510.80	512.90	512.60
4.....	512.65	512.90	512.75	512.75	512.55	513.20	512.20	510.20	514.15	510.80	512.90	512.70
5.....	512.90	512.80	512.75	512.70	512.55	513.20	512.00	510.10	515.30	510.80	512.80	512.70
6.....	512.65	512.80	512.75	512.60	512.55	513.20	510.90	510.10	515.90	510.90	512.80	512.70
7.....	512.65	512.80	512.75	512.65	512.55	513.10	510.70	510.00	516.00	510.90	512.80	512.60
8.....	512.70	512.80	512.80	512.60	512.55	512.10	510.70	510.00	517.90	510.80	512.80	512.60
9.....	512.70	512.80	512.80	512.60	512.60	513.00	510.50	510.00	517.70	510.80	512.70	512.60
10.....	512.65	512.80	512.75	512.65	512.60	513.00	510.50	509.90	517.50	510.80	512.80	512.60
11.....	512.65	512.75	512.75	512.70	512.60	513.00	510.60	509.90	515.40	510.70	512.80	512.70
12.....	512.65	512.70	512.70	512.65	512.60	512.85	510.50	509.90	512.90	510.50	512.80	512.70
13.....	512.60	512.70	512.75	512.65	512.60	512.80	510.20	509.80	512.50	510.60	512.70	512.70
14.....	512.70	512.70	512.75	512.65	512.60	512.70	510.20	509.80	512.20	510.50	512.70	512.60
15.....	512.70	512.80	512.75	512.65	512.60	512.80	510.20	509.80	511.70	510.30	512.80	512.60

Daily elevation of water-surface (B.C. Datum) of **GENESEE RIVER ABOVE W. S. R. R.****BRIDGE AT GENESEE JUNCTION, for the year ended June 30, 1921—Continued**

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
16.	512.70	512.75	512.70	512.60	512.60	512.90	510.20	509.80	511.50	510.30	512.80	512.70
17.	512.70	512.75	512.70	512.60	512.70	512.70	510.20	516.65	511.00	510.30	512.70	512.70
18.	512.70	512.70	512.70	512.60	512.70	512.70	510.20	518.00	510.40	510.40	512.70	512.70
19.	512.70	512.70	512.60	512.55	512.75	512.70	510.10	513.80	510.25	510.40	512.60	512.80
20.	512.80	512.70	512.60	512.60	512.80	512.55	510.10	512.80	510.50	510.40	512.60	512.80
21.	512.80	512.65	512.60	512.60	512.80	512.55	510.10	512.80	510.50	510.60	512.70	512.80
22.	512.75	512.70	512.55	512.55	513.90	512.50	510.10	512.40	510.50	514.10	512.70	512.70
23.	512.80	512.75	512.60	512.55	514.20	512.50	510.10	512.30	510.30	514.00	512.70	512.70
24.	514.70	512.75	512.60	512.60	514.90	510.30	510.00	512.30	510.30	513.50	512.80	512.70
25.	517.30	512.70	512.60	512.60	514.00	510.30	510.00	512.00	510.00	513.50	512.80	512.70
26.	518.10	512.70	512.65	512.60	513.00	510.20	510.00	511.80	510.00	513.20	512.70	512.70
27.	518.00	512.70	512.60	512.60	513.00	510.20	510.00	511.40	510.00	513.20	512.70	512.70
28.	515.00	512.70	512.75	512.55	512.95	510.20	510.00	511.10	510.70	513.10	512.70	512.70
29.	513.15	512.75	512.75	512.55	512.95	510.20	510.00	.....	511.80	513.10	512.80	512.70
30.	513.15	512.75	512.75	512.50	512.90	510.15	510.00	.....	511.60	513.10	512.80	512.70
31.	513.00	512.80	.....	512.50	.....	510.10	510.00	.....	511.00	.....	512.70	.....

GENESEE RIVER AT DRIVING PARK AVENUE, ROCHESTER

Location.—In station No. 5 of the Rochester Gas and Electric Corporation, 400 feet above Driving Park Avenue bridge, about $1\frac{1}{2}$ miles below the center of the city of Rochester, Monroe county, and 5 miles above the mouth of the river.

Drainage area.—2,460 square miles.

Records available.—December 14, 1919, to June 30, 1921.

Gage.—Gurley 7-day water-stage recorder installed in north-west corner of power house. Chain gage at same location from April 5 to June 30, 1920. Recorder inspected by C. M. Hawkins, of Rochester Gas and Electric Corporation.

Discharge measurements.—Made from cable about 2,000 feet below gage.

Channel and control.—Coarse gravel and large broken rock.

Ice.—Stage discharge relation probably not affected by ice.

Regulation.—Daily discharge is affected by storage for power purposes at Rochester and points above.

Diversions.—The Barge canal which crosses the river at a point near the southern line of the city of Rochester discharges water into the stream from Lake Erie and diverts water to the east for canal purposes.

Coöperation.—Station established and maintained by the United States Geological Survey in coöperation with the State Engineer and Surveyor, the City Engineer of Rochester and the Rochester Gas and Electric Corporation.

On account of incomplete rating, no estimates of discharge have been made for current year.

Discharge measurements of GENESEE RIVER AT DRIVING PARK AVENUE, ROCHESTER,
during the year ending June 30, 1921

DATE	Made by	Gage height	Dis-charge
		<i>Feet</i>	<i>Sec.-ft.</i>
July 21.....	Otto Lauterhahn.....	a 3.97	2,120
Aug. 17.....	Otto Lauterhahn.....	a 3.72	1,710
Aug. 19.....	Otto Lauterhahn.....	a 3.77	2,480
Nov. 8.....	Otto Lauterhahn.....	2.40	1,300
Nov. 24.....	Otto Lauterhahn.....	7.84	9,450
Nov. 24.....	Otto Lauterhahn.....	7.70	9,700
Dec. 13.....	Otto Lauterhahn.....	3.50	2,630
Feb. 17.....	Otto Lauterhahn.....	9.03	12,900
Mar. 15.....	Otto Lauterhahn.....	5.67	5,390
Mar. 23.....	Otto Lauterhahn.....	4.35	3,170
Mar. 24.....	Otto Lauterhahn.....	4.25	3,090
May 27.....	B. F. Howe.....	3.55	2,450

a Gage height read on chain gage and reduced to datum of automatic gage.

CANASERAGA CREEK, NEAR DANSVILLE

Location.—At highway bridge 1 mile west of Dansville, Livingston county, 2,200 feet below mouth of Mill brook and about 22 miles above mouth of creek.

Drainage area.—158 square miles (measured by engineers of State Conservation Commission).

Records available.—July 21, 1910, to December 31, 1912; July 10, 1915, to June 30, 1917; March 10, 1919, to June 17, 1919; March 17, 1920, to June 30, 1921.

Gage.—Gurley 7-day water-stage recorder installed October 19, 1920. Prior to this date, gage was a vertical staff at the downstream side of left abutment; observer, Frank S. Fox.

Discharge measurements.—Made from bridge or by wading.

Channel and control.—Sand and gravel; shifting frequently.

Extremes of discharge.—Maximum stage recorded during year, 11.50 feet at 7 A. M., July 24 (discharge, 3,950 second-feet); minimum discharge, 19 second-feet at 11 P. M., June 25, corresponding to a gage-height of 6.10 feet.

1910-1912, 1915-1917 and 1919-1921: Maximum stage recorded, 13.0 feet at 9:30 P. M., May 16, 1916 (discharge, determined from logarithmic extension of rating curve, roughly, 6,600 second-feet); minimum stage recorded, 5.2 feet several times during October and November, 1916 (discharge, about 15 second-feet).

Ice.—Stage-discharge relation affected by ice.

Accuracy.—Stage-discharge relation not permanent. Rating curves fairly well defined between 30 and 2,000 second-feet. Operation of water-stage recorder generally satisfactory; staff gage readings used on days when recorder is out of commission. Daily discharge ascertained by applying mean daily gage heights

from recorder or as observed to rating table or for periods of considerable daily fluctuation in stage by averaging discharge for intervals of day. Records fair.

Coöperation.—Station maintained by the United States Geological Survey in coöperation with the State Engineer and Surveyor.

Discharge measurements of CANASERAGA CREEK NEAR DANSVILLE, during the year ending June 30, 1921

DATE	Made by	Gage height	Discharge
		<i>Feet</i>	<i>Sec.-ft.</i>
July 14.....	Otto Lauterhahn.....	6.26	52.3
Aug. 25.....	Lauterhahn and Covert.....	6.21	34.8
Aug. 25.....	Lauterhahn and Covert.....	6.205	35.2
Sept. 24.....	Lauterhahn and Lamoureux.....	6.08	24.2
Oct. 1.....	Otto Lauterhahn.....	7.60	476
Oct. 9.....	Otto Lauterhahn.....	6.24	38.5
Oct. 30.....	Otto Lauterhahn.....	6.19	34.0
Dec. 18.....	Otto Lauterhahn.....	6.55	90.8
Dec. 18.....	Otto Lauterhahn.....	6.55	90.4
Jan. 6.....	Otto Lauterhahn.....	6.82	157
Jan. 6.....	Otto Lauterhahn.....	6.82	156
Jan. 26.....	Otto Lauterhahn.....	a 7.50	84.1
Feb. 5.....	Otto Lauterhahn.....	a 6.89	61.7
Feb. 18.....	Otto Lauterhahn.....	7.25	313
Feb. 26.....	Otto Lauterhahn.....	a 6.61	77.5
Feb. 28.....	Otto Lauterhahn.....	6.78	139
Mar. 9.....	Otto Lauterhahn.....	8.29	905
Mar. 9.....	Otto Lauterhahn.....	8.68	1,200
Mar. 10.....	Otto Lauterhahn.....	7.80	598
June 2.....	Otto Lauterhahn.....	6.30	40.6
June 2.....	B. F. Howe.....	6.30	37.5
June 2.....	Howe and Lauterhahn.....	6.30	38.6

a Backwater from ice.

Daily discharge, in second-feet, of CANASERAGA CREEK NEAR DANSVILLE, for the year ending June 30, 1921

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....		65	25	427	35	190	81	50	181	323	155	39
2.....		54	25	175	36	604	406	46	653	247	161	40
3.....		49	25	112	41	418	255	46	563	192	136	38
4.....	23	44	25	70	42	306	184	70	310	161	117	35
5.....	23	40	25	58	41	246	178	80	427	139	104	32
6.....	23	40	30	54	38	211	162	75	592	122	95	34
7.....	25	34	30	46	36	172	127	65	988	112	86	31
8.....	31	44	25	40	36	140	169	65	988	107	78	31
9.....	53	44	25	40	36	112	134	70	1,060	164	70	30
10.....	33	54	27	34	41	94	112	72	1,130	136	65	31
11.....	31	54	32	34	41	94	112	70	332	117	62	39
12.....	29	46	96	34	40	94	85	72	288	104	60	40
13.....	25	40	65	34	34	94	79	63	453	95	63	38
14.....	36	40	46	34	33	165	79	63	288	88	60	34
15.....	33	46	36	30	33	183	74	66	247	86	55	30
16.....	31	46	32	30	33	127	70	294	288	84	53	31
17.....	27	61	27	34	49	107	65	1,010	209	143	52	35
18.....	25	151	25	32	49	94	60	422	192	161	49	34
19.....	300	75	25	31	55	90	60	250	161	145	49	28
20.....	96	54	25	30	75	83	70	151	161	134	46	27

Daily discharge, in second-feet, of CANASERAGA CREEK NEAR DANSVILLE, for the year ended June 30, 1921 — *Continued*

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
21.....	60	46	30	31	152	87	110	120	164	130	46	25
22.....	49	46	27	30	362	83	180	90	142	145	45	25
23.....	53	44	25	31	479	136	160	70	122	467	74	25
24.....	2,740	40	25	30	375	151	120	60	117	448	63	24
25.....	653	34	25	30	270	80	95	60	136	250	62	23
26.....	289	34	25	32	218	80	85	75	158	198	65	24
27.....	181	34	27	38	187	90	50	90	158	164	55	25
28.....	124	30	34	36	175	85	50	151	194	148	52	32
29.....	96	30	25	38	172	75	44	.....	228	158	65	50
30.....	75	25	96	36	160	75	46	.....	224	158	55	55
31.....	61	25	.....	34	.....	70	50	.....	226	.....	47	.....

NOTE.— Discharge, Dec. 25–31, Jan. 17–Feb. 7 and Feb. 21–27 determined from gage-heights corrected for ice effect from 3 discharge measurements, study of weather record and comparison with records at other stations. Mean daily discharge July 1–3 estimated at 30 second-feet; Feb. 19, June 20, 30 as shown in table. Staff-gage readings used Oct. 1–18, Jan. 23, 24, 26–Feb. 5, 20–Mar. 18; no automatic record.

Monthly discharge of CANASERAGA CREEK NEAR DANSVILLE, for the year ending June 30, 1921

[Drainage area, 158 square miles]

MONTH	DISCHARGE IN SECOND-FEET				RUN-OFF Depth in inches on drainage area
	Maximum	Minimum	Mean	Per square mile	
July.....	2,740	23	171	1.08	1.24
August.....	151	25	47.4	.300	.35
September.....	96	25	33.7	.213	.24
October.....	427	30	56.3	.356	.41
November.....	479	33	112	.709	.79
December.....	604	70	150	.949	1.09
January.....	406	44	115	.728	.84
February.....	1,010	46	136	.861	.90
March.....	1,130	117	367	2.32	2.68
April.....	467	84	171	1.08	1.20
May.....	161	45	72.4	.458	.53
June.....	55	23	32.8	.208	.23
The year.....	2,740	23	122	.772	10.50

CANASERAGA CREEK AT SHAKERS CROSSING

Location.—At highway bridge at Shakers Crossing, about 1 mile above mouth and $1\frac{1}{4}$ miles northeast of Mount Morris, Livingston county.

Drainage area.—335 square miles (measured by engineers of State Conservation Commission).

Records available.—Occasional current-meter measurements, 1904–1915. Continuous record of gage height and occasional current-meter measurements, July 13, 1915, to June 30, 1921.

Gage.—Gurley 7-day graph water-stage recorder on the left bank, just below bridge. Datum of gage same as that established on Genesee river at Jones bridge near Mount Morris July 12,

1915 (540.00 feet, Conservation Commission datum). Recorder inspected by Mrs. Wm. Russell.

Discharge measurements.—Made from the highway bridge or by wading.

Channel and control.—Firm gravel; not likely to shift; subject to backwater from Genesee river.

Ice.—Stage-discharge relation affected by ice.

Extremes of stage.—Maximum stage during year from water-stage recorder, 25.20 feet at 7 p. m., July 24; minimum stage from water-stage recorder, 7.83 feet from 6 to 10 a. m., June 26.

1915-1921: Maximum stage from water-stage recorder, 28.92 feet at 1 p. m., May 17, 1916; minimum stage from water-stage recorder, that of current year.

Coöperation.—Station maintained by the United States Geological Survey in coöperation with the State Engineer and Surveyor.

Station maintained for water surface elevations only.

Daily gage height, in feet, of CANASERAGA CREEK AT SHAKERS CROSSING, for the year ending June 30, 1921

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	8.04	9.03	8.37	12.30	8.28	.....	9.25	8.88	9.87	11.03	9.72	8.54
2.....	8.35	8.92	8.30	10.59	8.40	.....	11.54	8.80	10.51	10.95	9.70	8.43
3.....	8.28	8.82	8.13	9.33	8.42	.....	11.78	8.80	14.59	10.38	9.58	8.40
4.....	8.00	8.78	8.06	8.97	8.45	.....	10.21	8.85	12.60	10.00	9.27	8.45
5.....	8.00	8.72	8.01	8.80	8.41	10.31	9.90	8.97	10.80	9.77	9.13	8.36
6.....	8.20	8.70	8.05	8.70	8.39	10.17	9.90	9.57	12.56	9.51	8.97	8.31
7.....	8.32	8.53	8.06	8.65	8.35	9.88	9.34	9.31	18.96	9.35	8.91	8.30
8.....	8.32	8.32	8.18	8.60	8.35	9.52	9.72	9.05	18.74	9.26	8.84	8.37
9.....	8.35	8.48	8.30	8.59	8.36	9.20	9.70	9.18	17.80	9.61	8.74	8.38
10.....	8.48	8.78	8.25	8.51	8.38	9.12	9.25	9.50	17.45	9.84	8.67	8.38
11.....	8.38	9.00	8.12	8.51	8.39	9.10	9.34	9.15	13.20	9.56	8.64	8.34
12.....	8.32	8.80	8.75	8.49	8.40	9.03	9.11	9.19	11.52	9.23	8.66	8.44
13.....	8.16	8.82	9.05	8.49	8.36	9.07	8.85	9.11	12.18	9.09	8.93	8.43
14.....	8.04	9.69	8.80	8.45	8.13	10.09	9.01	9.03	12.01	9.02	8.99	8.40
15.....	8.10	10.04	8.71	8.42	8.49	11.30	8.92	9.08	11.14	9.03	8.93	8.41
16.....	8.07	9.20	8.66	8.40	8.49	9.78	8.81	11.43	11.02	9.06	8.84	8.38
17.....	8.06	9.04	8.59	8.20	8.55	9.29	8.70	20.98	10.75	10.02	8.81	8.33
18.....	8.08	10.00	8.48	8.20	8.62	9.10	8.82	15.62	10.31	11.10	8.78	8.27
19.....	9.86	9.03	8.25	8.31	8.70	8.98	8.96	11.62	10.10	10.55	8.74	8.07
20.....	9.25	8.87	8.14	8.19	8.86	9.11	8.85	10.27	10.04	9.93	8.68	8.08
21.....	8.90	8.72	8.18	8.01	9.22	9.03	9.01	9.57	10.19	9.64	8.68	8.15
22.....	8.73	8.70	8.00	8.01	11.88	9.01	10.00	9.46	10.05	9.80	8.46	8.10
23.....	8.82	8.74	8.01	8.00	15.80	9.70	10.10	9.21	9.78	10.91	8.65	8.04
24.....	21.93	8.69	7.93	7.98	14.43	10.38	9.45	9.08	9.64	13.58	8.96	7.96
25.....	20.35	8.63	7.89	7.95	11.73	9.31	9.06	9.05	9.66	11.13	8.90	7.86
26.....	14.25	8.60	7.91	7.97	10.79	9.33	9.12	9.00	9.74	10.11	8.98	7.86
27.....	11.80	8.58	7.93	8.00	.....	9.37	9.20	8.91	9.75	9.70	8.91	7.90
28.....	10.38	8.53	8.03	8.07	.....	9.23	9.06	9.53	9.96	9.60	8.69	7.95
29.....	9.58	8.36	8.06	8.08	.....	9.28	8.95	.....	11.20	9.61	8.79	8.16
30.....	9.26	8.34	8.59	8.11	.....	9.25	8.91	.....	10.74	9.89	8.85	8.28
31.....	9.10	8.38	.....	8.09	.....	9.15	8.94	.....	10.29	.....	8.66	.....

NOTE.—No gage-height record, Nov. 27 to Dec. 4; recorder did not operate. Estimates for portions of day made from recorder graph Jan. 1, April 2, 29, 30, May 7, 13, 14, 20, 21, 27, 28, June 1.

KESHEQUA CREEK AT CRAIG COLONY, SONYEA

Location.—About 200 feet downstream from private highway bridge on grounds of Craig Colony at Sonyea, Livingston county.

Drainage area.—70 square miles (measured by the State Conservation Commission).

Records available.—October 31, 1917, to June 30, 1921, at present site.

Gage.—Vertical staff in three sections on retaining wall on left bank, just above the concrete dam for pumping plant of Craig Colony; read by A. J. Porter.

Discharge measurements.—Made from the private highway bridge above gage, or by wading.

Control.—Double-crested concrete dam built by Craig Colony for maintaining water level for their pumping plant; permanent.

Extremes of discharge.—Maximum stage recorded during year, 3.65 feet at 9 A. M., July 24 (discharge, 2,040 second-feet); minimum stage recorded, 0.26 foot at 5 P. M., June 23 (discharge, 3.4 second-feet).

1917-1921: Maximum stage recorded, 5.9 feet at 10 A. M., May 22, 1919 (discharge, 5,940 second-feet); minimum stage recorded, 0.13 foot at 8 A. M., August 20, 1918 (discharge, 0.7 second foot).

Ice.—Stage-discharge relation slightly affected by ice.

Accuracy.—Stage-discharge relation permanent, except for change caused by temporary dam August 3 to November 11. Rating curve used during normal conditions well defined below 500 second-feet; curve used for period of backwater effect from flashboards approximate only. Gage read to hundredths twice daily. Daily discharge determined by applying mean daily gage-height to rating table. Records during normal conditions good, for other periods, roughly approximate.

Coöperation.—Station maintained by the United States Geological Survey in coöperation with the State Engineer and Surveyor.

Discharge measurements of KESHEQUA CREEK AT CRAIG COLONY, SONYEA, during
the year ending June 30, 1921

DATE	Made by	Gage height	Discharge
		<i>Feet</i>	<i>Sec.-ft.</i>
Aug. 9.....	Otto Lauterhahn.....	a 2.24	7.52
Aug. 9.....	Otto Lauterhahn.....	a 2.24	7.74
Aug. 25.....	Lauterhahn and Covert.....	a 2.28	9.11
Oct. 19.....	Otto Lauterhahn.....	a 2.26	7.89
Dec. 18.....	Otto Lauterhahn.....	.68	26.0
Jan. 7.....	Otto Lauterhahn.....	.70	30.3
Jan. 7.....	Otto Lauterhahn.....	.745	34.6
Jan. 7.....	Otto Lauterhahn.....	.815	44.5
Mar. 10.....	Otto Lauterhahn.....	1.39	175
Mar. 10.....	Otto Lauterhahn.....	1.38	175
June 1.....	Howe and Lauterhahn.....	.46	9.34
June 2.....	Howe and Lauterhahn.....	.395	7.51
June 2.....	Howe and Lauterhahn.....	.39	7.03

a Backwater from temporary dam.

Daily discharge in second-feet, of KESHEQUA CREEK AT CRAIG COLONY, SONYEA, for
the year ending June 30, 1921

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	6.3	16	7	160	9.	63	30	11	61	109	47.	8.6
2.....	6.6	12	7	40	9.	296	235	14	186	70	53.	8.0
3.....	6.3	8	7	19	10.	105	95	16	223	52	42.	7.5
4.....	5.6	12	7	16	10.	87	58	14	82	46	36.	6.8
5.....	5.9	15	7	12	9.	67	60	21	70	40	31.	6.8
6.....	4.8	12	7	11	10.	58	52	58	291	39	28.	4.7
7.....	4.8	8	7	10	8.	50	29	37	470	35	24.	.....
8.....	6.3	8	7	9	9.	39	69	40	680	30	21.	.....
9.....	9.1	8	7	9	9.	27	39	46	505	100	20.	.....
10.....	7.8	18	7	9	9.	29	20	65	197	56	19.	.....
11.....	6.3	26	8	8	9.	29	29	31	119	41	16.	6.1
12.....	4.8	24	34	8	13.	29	26	34	91	37	16.	13.
13.....	6.6	20	14	9	12.	30	21	29	141	35	18.	8.0
14.....	5.6	55	11	8	8.6	67	22	34	93	30	19.	8.0
15.....	5.6	28	9	8	7.5	53	20	34	80	28	15.	6.4
16.....	5.6	18	9	8	8.6	36	17	458	133	27	14.	4.0
17.....	4.8	22	8	8	12.	29	12	340	69	166	13.	4.4
18.....	7.0	18	7	8	16.	26	20	117	63	153	12.	6.8
19.....	92.	14	7	8	17.	20	24	65	54	127	13.	5.4
20.....	25.	10	6	8	27.	24	26	39	87	78	12.	4.0
21.....	17.	9	7	7	52.	24	44	31	60	76	9.7	3.8
22.....	8.2	10	7	8	173.	24	67	35	50	84	9.7	4.0
23.....	11.	11	7	8	410.	144	67	31	41	219	24.	3.7
24.....	1130.	9	6	7	179.	56	25	24	40	127	17.	4.7
25.....	163.	8	6	8	119.	29	15	12	50	74	28.	3.7
26.....	72.	8	7	8	97.	25	17	19	44	56	20.	5.0
27.....	43.	9	7	8	82.	39	20	27	41	50	14.	6.8
28.....	33.	7	9	9	82.	29	7	54	122	39	16.	9.0
29.....	20.	7	8	9	82.	22	8	.....	100	42	14.	14.
30.....	18.	7	40	9	61.	31	10	.....	91	53	16.	12.
31.....	15.	7	.....	9	.....	31	11	.....	74	.....	11.	.....

NOTE.— Discharge estimated Jan. 25–Feb. 3 because of ice effect; Aug. 12, Feb. 8, June 7–10 at 5.5 second-feet, 26, 28, no gage-height record. Discharge, Aug. 3–Nov. 11, determined from special rating on account of backwater from temporary dam.

Monthly discharge of KESHEQUA CREEK, at CRAIG COLONY, SONTA, for the year ending June 30, 1921

(Drainage area 70 square miles)

MONTH	DISCHARGE IN SECOND-FEET				RUN-OFF
	Maximum	Minimum	Mean	Per square mile	Depth in inches on drainage area
July....	1,130	4.8	56.8	.810	.93
August....	55	7	14.3	.204	.24
September....	40	6	9.57	.137	.15
October....	160	7	15.0	.214	.25
November....	410	7.5	52.0	.743	.83
December....	296	22	52.2	.746	.86
January....	235	7	38.5	.550	.63
February....	458	11	62.0	.886	.92
March....	680	40	142	2.03	2.34
April....	219	27	70.6	1.01	1.13
May....	53	9.7	20.9	.299	.34
June....	14	3.7	6.57	.094	.10
The year....	1,130	3.7	45.0	.643	8.72

CONESUS CREEK, NEAR LAKEVILLE

Location.— At highway bridge known locally as Millville bridge, $1\frac{1}{2}$ miles north of Lakeville, Livingston county, and the outlet of Conesus lake.

Drainage area.— 71 square miles (furnished by State Conservation Commission).

Records available.— November 13, 1919, to June 30, 1921.

Gage.— Vertical staff bolted to upstream side of right abutment of bridge; read by W. B. Milliman.

Discharge measurements.— Made from bridge 500 feet down stream, or by wading.

Channel and control.— A rectangular weir, 2.01 feet long and 0.67 foot high under upstream side of bridge. When the water overtops this weir it flows over a 2-inch plank 25.75 feet long, including the 2 feet of weir.

Extremes of discharge.— Maximum stage recorded during year, 2.10 feet at 5 p. m., February 16 (discharge, 157 second-feet); minimum stage recorded, 0.79 foot at 7 a. m., July 17 (discharge, 11 second-feet).

1919-1921: Maximum stage recorded, 2.10 feet at 8 a. m., March 17, 1920 (discharge, 159 second-feet); minimum stage recorded, .79 foot December 12, 1919, and July 17, 1920 (discharge, 11 second-feet).

Ice.— Creek frozen over in winter, but weir is usually kept free of ice.

Diversions.— No water is diverted from Conesus lake above the station.

Accuracy.—Stage-discharge relation practically permanent. Rating curve well defined between 4 and 150 second-feet. Daily discharge ascertained by applying mean daily gage heights to rating table. Results good.

Coöperation.—Station maintained by the United States Geological Survey in coöperation with the City Engineer of Rochester and the State Engineer and Surveyor.

Discharge measurements of CONESUS CREEK NEAR LAKEVILLE, during the year ending June 30, 1921

DATE	Made by	Gage height	Discharge
		<i>Feet</i>	<i>Sec.-ft.</i>
July 17.....	Otto Lauterhahn.....	.78	10.0
July 26.....	Otto Lauterhahn.....	1.175	38.8
Aug. 20.....	Otto Lauterhahn.....	1.34	56.0
Mar. 11.....	Otto Lauterhahn.....	1.87	122
Mar. 11.....	Otto Lauterhahn.....	1.86	119
May 28.....	Lauterhahn and Howe.....	1.24	46.2

Daily discharge, in second-feet, of CONESUS CREEK NEAR LAKEVILLE, for the year ending June 30, 1921

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	17	34	37	28	16	43	47	38	71	101	94	36
2.....	17	34	36	28	17	55	49	38	70	101	88	34
3.....	17	32	34	28	17	61	51	38	75	101	88	34
4.....	15	30	32	28	17	61	51	37	74	101	88	30
5.....	15	28	32	26	16	62	51	51	73	101	88	28
6.....	14	28	33	25	15	62	51	57	75	94	82	28
7.....	14	30	33	25	15	61	56	41	82	94	82	26
8.....	14	27	32	25	15	61	57	41	94	94	75	25
9.....	13	28	30	25	15	61	58	49	121	94	75	24
10.....	12	28	30	24	15	61	56	41	114	94	70	24
11.....	13	28	32	22	15	58	52	43	121	88	69	24
12.....	13	27	32	22	14	58	51	42	121	88	65	23
13.....	12	26	32	22	13	58	51	43	121	88	64	22
14.....	12	28	30	22	14	63	51	42	121	82	64	20
15.....	12	36	28	21	13	59	49	42	121	82	62	20
16.....	11	47	28	21	12	58	49	94	121	82	59	20
17.....	11	53	27	20	13	56	49	68	121	88	58	18
18.....	11	56	26	20	16	55	47	75	121	94	56	18
19.....	13	53	25	19	16	53	47	75	121	94	56	18
20.....	13	56	24	17	16	53	47	75	121	94	56	18
21.....	13	56	24	20	16	51	44	75	114	88	55	17
22.....	12	53	23	20	17	55	44	73	114	94	55	17
23.....	12	51	22	17	30	51	46	73	108	88	56	17
24.....	25	49	23	17	30	50	44	71	114	108	52	16
25.....	36	49	22	17	32	49	44	70	108	101	52	16
26.....	39	47	21	17	34	51	42	68	101	101	47	17
27.....	36	44	21	18	34	50	42	67	101	101	47	16
28.....	39	42	21	17	35	49	40	74	108	94	44	17
29.....	36	41	21	17	36	48	40	.....	108	94	42	16
30.....	35	40	24	17	36	47	40	.....	108	94	42	16
31.....	34	40	.....	16	.....	45	40	.....	108	.....	40	.....

Monthly discharge of CONESUS CREEK NEAR LAKEVILLE, for the year ending June 30, 1921

[Drainage area 71 square miles]

MONTH	DISCHARGE IN SECOND-FEET				RUN-OFF
	Maximum	Minimum	Mean	Per square mile	Depth in inches on drainage area
July.....	39	11	18.9	.266	.31
August.....	56	26	39.4	.555	.64
September.....	37	21	27.8	.392	.44
October.....	28	16	21.3	.300	.35
November.....	36	12	20.0	.282	.31
December.....	63	43	55.0	.775	.89
January.....	58	40	48.0	.676	.78
February.....	94	37	57.2	.806	.84
March.....	121	70	105	1.48	1.71
April.....	108	82	93.9	1.32	1.47
May.....	94	40	63.6	.896	1.03
June.....	36	16	21.8	.307	.34
The year.....	121	11	47.6	0.670	9.11

CANADICE LAKE OUTLET, NEAR HEMLOCK

Location.—At foot of Canadice lake, Livingston county, outlet flows into Genesee river through Canadice Lake outlet and Honeoye creek.

Drainage area.—12.6 square miles, of which 1 square mile is lake surface.

Records available.—April, 1903, to June 30, 1921.

Gage.—Hook, in channel above weir.

Channel and control.—Outflow is measured over a standard thin-edged weir with a 5-foot crest and 2 end contractions so arranged with needle timbers at the ends that the length may be increased to 14.96 feet. No end contractions during high water. The weir crest stands 3.14 feet above the stream channel, which is artificial with a plank bottom and vertical sides, and the crest is never submerged by backwater. Two additional rectangular gates, each 1 foot square with three complete contractions and a fourth incomplete contraction at the bottom.

Ice.—Stage-discharge relation not affected by ice, as the pool above the weir is free from ice throughout the winter.

Diversions.—No water is diverted from Canadice lake above the station.

Regulation.—Outflow of lake is regulated by bulkhead and gates at dam above weir.

Accuracy.—Stage-discharge relation permanent. Rating curve used is expressed by Francis formula. Corrections are made for

velocity of approach for high stages. Gage read to hundredths once daily. Records good.

Coöperation.—Data collected, computed and furnished for publication by the City Engineer of Rochester.

Mean monthly water surface and monthly discharge of CANADICE LAKE NEAR HEMLOCK for the year ending June 30, 1921

[Drainage area, 12.6 square miles.]

MONTH	Mean elevation of lake above low-water mark	DISCHARGE IN SECOND-FEET		Run-off, inches on drainage area
		Mean	Per square mile	
July.....	1.870	28.155	2.234	2.560
August.....	0.907	14.726	1.169	1.347
September.....	0.190	2.991	0.237	0.265
October.....	0.190	2.991	0.237	0.274
November.....	0.174	2.441	0.194	0.216
December.....	1.029	17.705	1.405	1.620
January.....	0.685	11.898	0.944	1.088
February.....	0.667	11.525	0.915	0.952
March.....	1.880	14.416	1.144	1.013
April.....	2.697	17.811	1.414	1.576
May.....	2.768	9.836	0.781	0.900
June.....	0.767	16.409	1.302	1.452
Total.....	.....	.....	.....	13.263
Mean.....	1.152	12.575	0.998	.....
Corrected total and means.....	.....	10.045	0.797	10.592

NOTE.—The outlet of the lake is controlled by gates: the terminal water surface for the year ending June 30th, 1921, was 2.61 feet lower than that of the year previous, which corresponds to a loss of storage of 78,187,986 cubic feet.

BLACK CREEK, NEAR GENESEE JUNCTION

Gage No. 228

Location.—About $\frac{1}{2}$ mile above the mouth of Black creek, at the old Genesee Valley canal aqueduct over Black creek.

Records available.—June 11, 1917, to June 30, 1921.

Gage.—Staff on the upstream end of the center pier of the old aqueduct. Read by Mr. J. H. Begy.

Discharge.—No discharge obtained.

Accuracy.—Gage read once daily to half-tenths.

Coöperation.—Station established and maintained by this Department.

Daily elevation of water-surface (B. C Datum) of BLACK CREEK ABOVE CANAL FEEDER AT GENESEE JUNCTION, for the year ended June 30, 1921

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	512.60	513.05	512.80	512.80	512.55	513.0	509.9	509.9	510.5	510.3	513.0	512.6
2.....	512.60	513.05	512.80	512.80	512.60	513.4	512.1	510.1	509.9	511.1	512.9	512.5
3.....	512.60	513.05	512.75	512.80	512.50	513.3	513.0	510.1	513.5	510.7	512.7	512.5
4.....	512.60	512.90	512.75	512.75	512.50	513.2	512.3	510.1	514.05	510.7	512.7	512.55
5.....	512.65	512.85	512.75	512.75	512.55	513.2	512.1	510.0	515.2	510.7	512.6	512.6
6.....	512.65	512.80	512.75	512.60	512.55	513.2	511.0	510.0	515.8	510.8	512.65	512.6
7.....	512.70	512.80	512.75	512.60	512.55	513.1	510.3	510.0	515.9	510.8	512.65	512.5
8.....	512.80	512.80	512.80	512.60	512.55	513.1	510.7	509.9	517.8	510.7	512.7	512.5
9.....	512.80	512.80	512.80	512.60	512.60	513.05	510.5	509.9	517.55	510.7	512.6	512.5
10.....	512.80	512.80	512.70	512.65	512.60	513.0	510.5	509.9	517.4	510.7	512.7	512.5
11.....	512.75	512.75	512.70	512.75	512.60	513.0	510.5	509.9	517.3	510.55	512.7	512.55
12.....	512.70	512.70	512.70	512.60	512.60	512.8	510.5	509.8	512.8	510.4	512.7	512.6
13.....	512.75	512.70	512.75	512.60	512.65	512.8	510.2	509.7	512.4	510.4	512.65	512.6
14.....	512.70	512.70	512.75	512.60	512.60	512.7	510.2	509.7	512.1	510.4	512.6	512.55
15.....	512.75	512.80	512.70	512.60	512.60	512.8	510.2	509.7	511.6	510.2	512.65	512.6
16.....	512.75	512.80	512.70	512.60	512.60	512.95	510.2	509.7	511.35	510.2	512.7	512.6
17.....	512.75	512.80	512.70	512.60	512.70	512.75	510.2	516.55	510.9	510.15	512.6	512.6
18.....	512.70	512.80	512.70	512.60	512.70	512.7	510.2	518.0	510.3	510.3	512.6	512.6
19.....	512.70	512.75	512.60	512.55	512.75	512.7	510.1	513.65	510.1	510.3	512.5	512.6
20.....	512.75	512.70	512.65	512.55	512.80	512.5	510.1	512.7	510.4	510.3	512.5	512.7
21.....	512.80	512.70	512.55	512.55	512.80	512.5	510.1	512.7	510.4	510.5	512.6	512.7
22.....	512.80	512.75	512.60	512.55	513.00	512.5	510.1	512.25	510.4	514.1	512.6	512.6
23.....	512.80	512.75	512.60	512.55	514.30	512.5	510.1	512.15	510.2	513.9	512.6	512.6
24.....	512.80	512.70	512.60	512.60	515.0	510.3	510.0	512.15	510.15	513.4	512.65	512.6
25.....	517.40	512.70	512.60	512.60	514.1	510.3	510.0	511.9	509.95	513.4	512.7	512.6
26.....	518.10	512.70	512.65	512.65	513.0	510.2	509.9	511.7	509.9	513.1	512.6	512.6
27.....	518.10	512.70	512.65	512.60	513.0	510.2	509.9	511.3	509.9	513.1	512.6	512.6
28.....	515.60	512.75	512.75	512.55	512.9	510.2	509.9	511.0	510.55	513.0	512.6	512.6
29.....	513.40	512.75	512.75	512.55	512.9	510.2	599.9	.....	511.7	513.0	512.65	512.6
30.....	513.40	512.80	512.75	512.50	512.9	510.1	509.9	.....	511.5	513.0	512.7	512.6
31.....	513.15	512.80	.....	512.50	.....	510.1	509.9	.....	510.9	.....	512.65	.....

BARGE CANAL, NEAR SOUTH GREECE

Location.—Slope station between South Greece, Monroe county, and the Genesee river. The Erie canal takes water from the Barge canal below South Greece. There is practically no diversion of water from this point to the Genesee river, a distance of about 5 miles. The canal flows through a rockcut for nearly the entire distance.

Records available.—July 1, 1918, to June 30, 1921, when operation of the station was assumed by the State Engineer and Surveyor.

Gages.—Two Gurley 7-day water-stage recorders with 2:1 scale for gage heights. The float wells are 18 inches by 30 inches inside dimensions with the bottom about 2 feet below normal canal level.

Gage No. 1 is located on the left bank near the spillway, just below the Junction lock at South Greece; inspected by the gatekeeper at the lock.

Gage No. 2 is located on the right bank, just west of the upper gate in the west guard lock; inspected by the lock tender.

Discharge measurements.—Made from the steel highway bridge, just below gage No. 1. Occasional measurements at the guard lock near gage No. 2.

Determination of discharge.—Daily discharge determined by the Chezy formula. The coefficient "C," computed from each current-meter measurement, is plotted with reference to the date of measurement. A mean curve through the plotted points indicates the value of "C" for any day. The other factors in the Chezy formula are obtained from gage height records and standard cross-section of the canal.

Regulation.—Flow in canal is regulated by operators at Lockport and South Greece.

Ice.—There is usually no flow in the canal during the winter months.

Accuracy.—Value of "C" fairly well defined. Gage-height records fair. Mean daily gage-heights obtained, for days of great fluctuation, by integration. Results fair, except for days of indeterminate discharge, when discharge was zero or to the west; records for such periods not computed.

Coöperation.—Station established and maintained by the United States Geological Survey in coöperation with the State Engineer and Surveyor.

Discharge data for current year withheld from publication.

Discharge measurements of BARGE CANAL NEAR SOUTH GREECE, during the year ending June 30, 1921

DATE	Made by	GAGE HEIGHT		Dis-charge
		Gage No. 1	Gage No. 2	
		<i>Feet</i>	<i>Feet</i>	<i>Sec.-ft.</i>
July 12	Otto Lauterhahn	2.600	2.600	757
July 28	Otto Lauterhahn	2.628	2.588	625
Aug. 12	Otto Lauterhahn	2.735	2.679	750
Aug. 30	Otto Lauterhahn	2.637	2.552	818
Sept. 1	Otto Lauterhahn	2.532	2.461	795
Sept. 8	Otto Lauterhahn	2.552	2.485	777
Oct. 4	Otto Lauterhahn	2.745	2.651	840
Oct. 21	Otto Lauterhahn	2.695	2.616	749
Nov. 3	Otto Lauterhahn	2.755	2.610	944
Nov. 22	Otto Lauterhahn	2.673	2.607	666
Dec. 9	Otto Lauterhahn	2.628	2.530	747
May 27	Otto Lauterhahn	2.684	2.609	693

BARGE CANAL AT LOCK 32, PITTSFORD

Location.—At lock 32, Barge canal, about 5 miles east of the city of Rochester and $\frac{3}{4}$ mile above the village of Pittsford, Monroe county.

Records available.—May 17, 1919, to June 30, 1921, when operation of station was assumed by the State Engineer and Surveyor.

Gage.—Gurley 7-day graph water-stage recorder, located 25 feet up stream from concrete weir in diversion channel south of the lock house. Recorder inspected by M. H. Quigley, lock tender at lock 32.

Discharge measurements.—Made by wading about 50 feet below gage.

Control.—Control is the crest of spillway.

Determination of discharge.—Daily discharge over spillway determined by discharge integration. Daily discharge through lock obtained by multiplying the lock capacity by the number of lockages per day. The following tables of discharge include the flow over the spillway and through the lock.

Accuracy.—Stage-discharge relation practically permanent. Results good.

Coöperation.—Station established and maintained by the United States Geological Survey in coöperation with the State Engineer and Surveyor.

Discharge measurements of BARGE CANAL AT LOCK No. 32, PITTSFORD, during the year ending June 30, 1921

DATE	Made by	Gage height	Discharge
		<i>Feet</i>	<i>Sec.-ft.</i>
July 13.....	Otto Lauterhahn.....	1.48	84.9
July 13.....	Otto Lauterhahn.....	1.44	87.2
July 19.....	Otto Lauterhahn.....	1.59	128
July 19.....	Otto Lauterhahn.....	1.58	111
July 19.....	Otto Lauterhahn.....	1.63	114
July 30.....	Otto Lauterhahn.....	1.34	64.6
July 30.....	Otto Lauterhahn.....	1.34	64.8
July 30.....	Otto Lauterhahn.....	1.34	63.4
Aug. 5.....	Otto Lauterhahn.....	1.60	123
Aug. 5.....	Otto Lauterhahn.....	1.59	124
Aug. 18.....	Otto Lauterhahn.....	1.30	61.0
Aug. 18.....	Otto Lauterhahn.....	1.32	62.7
Sept. 2.....	Otto Lauterhahn.....	1.57	108
Sept. 2.....	Otto Lauterhahn.....	1.56	115
Oct. 20.....	Otto Lauterhahn.....	1.80	171
Oct. 20.....	Otto Lauterhahn.....	1.78	166
Nov. 4.....	Otto Lauterhahn.....	1.40	77.2
Nov. 9.....	Otto Lauterhahn.....	1.33	65.7
Nov. 9.....	Otto Lauterhahn.....	1.32	64.0
Nov. 23.....	Otto Lauterhahn.....	1.26	52.9
Nov. 23.....	Otto Lauterhahn.....	1.25	52.0
May 28.....	Lauterhahn and Howe.....	1.24	53.2
May 28.....	Lauterhahn and Howe.....	1.22	49.6

REPORT OF STATE ENGINEER

Daily discharge, in second-feet, of BARGE CANAL AT LOCK 32, PITTSFORD, for the year ending June 30, 1921

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	May	June
1.....	82	107	139	113	103	80	.....	44
2.....	78	86	132	131	94	92	.....	32
3.....	160	107	132	129	131	88	50	31
4.....	139	125	106	142	92	56	116	41
5.....	119	114	118	161	54	109	57	58
6.....	80	91	149	141	96	163	76	114
7.....	105	104	147	125	88	114	95	87
8.....	142	127	124	132	84	154	131	83
9.....	115	157	132	125	81	180	125	80
10.....	102	107	128	140	80	162	69	109
11.....	94	100	127	125	67	163	76	98
12.....	114	81	129	130	150	144	57	109
13.....	98	80	133	169	182	125	70	180
14.....	88	105	123	197	118	158	55	85
15.....	105	141	171	169	112	174	55	118
16.....	111	120	143	139	132	152	48	108
17.....	131	83	131	132	139	121	77	96
18.....	121	87	127	129	105	142	54	81
19.....	104	122	129	148	82	142	57	76
20.....	90	123	130	163	116	134	66	89
21.....	112	125	123	172	170	60	62	122
22.....	105	150	131	132	143	46	50	100
23.....	94	93	162	131	64	.....	42	83
24.....	132	102	137	132	91	.....	49	104
25.....	133	135	123	137	89	.....	53	129
26.....	84	118	126	132	116	.....	32	92
27.....	107	122	110	128	123	.....	93	122
28.....	127	124	144	135	118	.....	51	119
29.....	82	135	130	125	135	.....	45	120
30.....	86	135	118	138	95	.....	49	118
31.....	139	130	.....	137	.....	.....	47	.....

NOTE.— Discharge over spillway estimated from recorder graph for following periods: July 2, 11–13, Oct. 1, 2, Dec. 16, 17, 21, 22; imperfect gage-height record.

Monthly discharge of BARGE CANAL at LOCK 32, PITTSFORD, for the year ending June 30, 1921

MONTH	DISCHARGE IN SECOND-FEET		
	Maximum	Minimum	Mean
July.....	160	78	109
August.....	157	80	114
September.....	171	106	132
October.....	197	113	140
November.....	182	54	108
December 1–22.....	180	46	125
May 3–31.....	131	32	66.8
June.....	180	31	94.3

BARGE CANAL AT LOCK 30, MACEDON

Location.—At lock 30, Barge canal, in the village of Macedon, Wayne county.

Records available.—November 1, 1919, to December 28, 1920, when the station was discontinued.

Gage.—Vertical staff attached to right wall about 50 feet above dam in diversion channel. Gage read by H. G. O'Dea, lock-tender at lock 30.

Discharge measurements.—Made by wading about 35 feet below gage.

Control.—Control is crest of spillway dam.

Determination of discharge.—Daily discharge over spillway determined by applying mean gage heights to rating table. Daily discharge through lock obtained from record of lockages and computation of discharge per lockage. The following tables of discharge include the flow over the spillway and through the lock.

Accuracy.—Stage-discharge relation probably permanent, except for possible backwater effect from weeds in summer. Rating curve fairly well defined. Gage-height record approximate only. Results fair.

Coöperation.—Station maintained by the United States Geological Survey in coöperation with the State Engineer and Surveyor.

Discharge measurements of BARGE CANAL AT LOCK 30, MACEDON, during the year ending June 30, 1921

DATE	Made by	Gage height	Discharge
July 20.	Otto Lauterhahn.	1.06	141
Aug. 21.	Otto Lauterhahn.	1.10	132
Aug. 23.	Otto Lauterhahn.	1.10	133
Sept. 9.	Otto Lauterhahn.	1.22	167
Oct. 22.	Otto Lauterhahn.	1.13	156
Nov. 10.	Otto Lauterhahn.	1.34	222
Nov. 10.	Otto Lauterhahn. ....	.425	35.7
Nov. 10.	Otto Lauterhahn. ....	.42	36.8
Nov. 10.	Otto Lauterhahn. ....	.65	69.2
Nov. 10.	Otto Lauterhahn. ....	.655	69.2
Nov. 11.	Otto Lauterhahn. ....	.90	107
Nov. 11.	Otto Lauterhahn.	1.34	223

Daily discharge, in second-feet, of BARGE CANAL AT LOCK 30, MACEDON, for the year ending June 30, 1921

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.
1.....	141	144	144	162	144	129
2.....	141	141	149	162	135	129
3.....	152	144	141	172	117	129
4.....	135	141	147	152	103	129
5.....	164	147	152	155	100	129
6.....	144	138	147	155	103	129
7.....	141	135	147	158	97	129
8.....	141	147	147	161	97	135
9.....	155	155	152	161	103	129
10.....	144	149	141	158	108	129
11.....	144	141	144	164	135	129
12.....	158	141	135	155	115	129
13.....	147	135	141	158	126	129
14.....	135	144	135	166	115	129
15.....	144	147	141	164	123	125
16.....	144	149	146	164	121	125
17.....	144	147	138	161	121	125
18.....	141	144	129	161	112	129
19.....	144	149	138	166	109	129
20.....	138	144	143	152	115	131
21.....	144	147	143	164	118	129
22.....	147	152	141	152	115	125
23.....	149	161	138	155	112	109
24.....	149	147	138	161	118	105
25.....	141	147	143	158	115	105
26.....	147	141	139	158	135	105
27.....	144	141	139	152	141	60
28.....	138	141	139	152	129	6
29.....	147	147	139	135	129	.....
30.....	147	144	139	141	135	.....
31.....	135	149	.....	147	.....	.....

Monthly discharge of BARGE CANAL AT LOCK 30, MACEDON, for the year ending June 30, 1921

MONTH	DISCHARGE IN SECOND-FEET		
	Maximum	Minimum	Mean
July.....	164	135	145
August.....	161	135	145
September.....	152	129	142
October.....	172	135	157
November.....	144	97	118
December 1-28.....	135	6	119

OSWEGO RIVER DRAINAGE BASIN

DESCRIPTION OF BASIN

Oswego river is formed by the union of Seneca and Oneida rivers at Three River Point about 12 miles northwest of Syracuse, whence its course is northwestward to Oswego, where it enters Lake Ontario. The length of the river, from the junction to the mouth, is about 20.5 miles and the drainage basin along this distance is a narrow strip of country, moderately rolling. Above the junction of the Seneca and Oneida rivers the basin spreads out, attaining an extreme width east and west of about 100 miles and north and south of from 70 to 80 miles. There is, on the whole, a gradual rise from the low, level lands which border Lake Ontario to the north-south ridges which separate the various lakes south of Seneca river and which farther south become merged with the still more elevated country lying along the southern boundary of the Lake Ontario watershed.

Of the 15 finger lakes in Central New York, 11, with water surface of about 283 square miles, lie in this drainage basin. These lakes have great influence in producing a uniform flow in the Oswego river.

Drainage areas tributary to ONEIDA LAKE AND ONEIDA RIVER *

LOCALITY	AREA IN SQUARE MILES		
	Place to place	Sub-total	Total
East branch, Fish creek.			
Head to junction with Alder creek	45.40	45.40	
Alder creek	25.70	71.10	
Junction with Alder creek to junction with Point Rock creek	36.70	107.80	
Point Rock creek	19.90	127.70	
Junction with Point Rock creek to junction with Fall brook	4.50	132.20	
Fall brook	13.50	145.70	
Junction with Fall brook to junction with Florence creek	1.30	147.00	
Florence creek	20.40	167.40	
Junction with Florence creek to junction with Furnace creek (Taberg)	1.70	169.10	
Furnace creek	14.40	183.50	
Taberg to junction with West branch, Fish creek	3.60	187.10	
West branch, Fish creek.			
Head to lower dam, Williamstown	25.80	25.80	
Williamstown to West Camden	27.10	52.90	
West Camden to junction with Mad river, Camden	14.20	67.10	
Mad river	45.40	112.50	
Camden to junction with Little river	21.60	134.10	
Little river	52.10	186.20	
Little river to McConnellsville	4.00	190.20	
McConnellsville to junction with East branch, Fish creek	11.90	202.10	
Total, East and West branches, Fish creek		389.20	
Junction of East and West branches, Fish creek, to junction with Wood creek	27.80	417.00	417.00
Wood creek (Oneida county).			
Above Erie canal, Rome	10.20	10.20	
Erie canal, Rome, to junction with Mud creek	2.00	12.20	
Mud creek (Oneida county)	20.00	32.20	

* From U. S. Geological Survey topographic maps.

Drainage areas tributary to ONEIDA LAKE AND ONEIDA RIVER *— *Continued*

LOCALITY	AREA IN SQUARE MILES		
	Place to place	Sub-total	Total
Wood creek — <i>Continued</i> .			
Junction with Mud creek to junction with Canada creek...	6.40	38.60	
Canada creek	31.00	69.60	
Junction with Canada creek to junction with Stony creek ..	1.20	70.80	
Stony creek	20.40	91.20	
Junction with Stony creek to junction with Fish creek	31.40	122.60	122.60
Oneida creek.			
Head to Peterboro	13.40	13.40	
Peterboro to Falls	6.70	20.10	
Falls to Munsville	15.60	35.70	
Munsville to Kenwood	27.30	63.00	
Kenwood to Oneida Castle (State dam)	10.80	73.80	
Oneida Castle to Sconondoa creek, Oneida	2.10	75.90	
Sconondoa creek	34.30	110.20	
Sconondoa creek to Durhamville	4.80	115.00	
Durhamville to mouth	28.00	143.00	143.00
Canaseraga creek (Madison county).			
Head to Perryville	5.70	5.70	
Perryville to Erie canal	9.00	14.70	
Erie canal to Douglas ditch	8.10	22.80	
Cowasselon creek.			
Head to Clockville creek	17.20	17.20	
Clockville creek	11.10	28.30	
Clockville creek to Erie canal	5.50	33.80	
Erie canal to mouth of Douglas ditch	39.30	73.10	
Total, all above junction with Douglas ditch		95.90	
Junction with Douglas ditch to Lakeport	3.20	99.10	99.10
Chittenango creek.			
Erieville reservoir, water-surface	0.45	0.45	
Erieville reservoir, land drainage	3.30	3.75	
Erieville reservoir to Cazenovia lake	30.50	34.25	
Cazenovia lake, water-surface	1.70	35.95	
Cazenovia lake, land drainage	8.70	44.65	
Cazenovia lake to Chittenango falls	14.40	59.05	
Chittenango falls to State dam, Chittenango	17.90	76.95	
State dam to junction with Butternut creek	28.10	105.05	
Butternut creek.			
Head to Jamesville reservoir	47.40	47.40	
Jamesville reservoir to State dam	5.70	53.10	
State dam to junction with Limestone creek	19.20	72.30	
Limestone creek.			
De Ruyter reservoir, water-surface	1.00	1.00	
De Ruyter reservoir, land drainage	17.80	18.80	
De Ruyter reservoir, to junction with East branch	4.30	23.10	
East, or New Woodstock branch	12.60	35.70	
Junction with East branch to junction with West branch	34.50	70.20	
West branch, Limestone creek, enters above State feeder dam	24.80	95.00	
State dam to junction with Butternut creek	18.20	113.20	
Total, Butternut and Limestone creeks, above junction		185.50	
Junction with Limestone creek to Chittenango creek	1.10	186.60	
Total, Chittenango and Butternut creeks, above junction		291.65	
Junction with Butternut creek to Bridgeport	30.30	321.95	
Bridgeport to Oneida lake	4.30	326.25	326.25
Oneida lake drainage through main streams		1,107.95	
Big Bay creek	26.30		
Little Bay creek	11.50		
Scriba creek	45.40		
Coast drainage, north shore Oneida lake	54.50		
Coast drainage, south shore Oneida lake	28.90	166.60	1,274.55
Water-surface, Oneida lake	78.00		
Land drainage, Oneida lake	1,274.55	1,352.55	
Oneida river.			
Brewerton to Caughdenoy creek	4.80	4.80	1,357.35
Caughdenoy creek	19.30	24.10	1,376.65
Caughdenoy creek to Oak Orchard	25.10	49.20	1,401.75
Mud creek (Onondaga county)	34.70	83.90	1,436.45
Oak Orchard to Potts creek	5.00	88.90	1,441.45
Potts creek	22.90	111.50	1,464.35
Six-Mile creek (Oswego county)	24.00	135.50	1,488.35
Potts creek to Three River Point	4.50	140.30	1,492.85

* From U. S. Geological Survey topographic maps.

Drainage areas tributary to SENECA RIVER *

LOCALITY	AREA IN SQUARE MILES			
	Place to place	Sub-total	Branch total	General total
Mud creek (Ontario county).				
Head to and including Schaffer creek.....	51.31			
Junction with Schaffer creek to junction with Sucker brook, Victor (formerly Ganargua creek).....	25.70	77.01		
Sucker brook.....	20.15	97.16		
Ganargua creek.....				
Victor to Erie canal, Macedon.....	26.20	123.36		
Macedon to junction with East Red creek, East Palmyra.....	55.00	178.36		
East Red creek.....	59.50	237.86		
East Red creek to Canandaigua outlet.....	61.37	299.23	290.23	
Canandaigua lake.....				
Naples creek.....	48.55	171.97		
West river.....	42.08			
Other land drainage.....	81.34			
Water-surface.....	16.40		188.37	
Canandaigua outlet.....				
Foot of the lake to and including Black brook..	50.37	238.74		
Black brook to Flint creek, at Phelps.....	54.34	293.08	293.08	
Flint creek.....				
Above Patten.....	31.59			
Patten to Gorham, not including Gorham swamp.....	24.84	56.43		
Gorham swamp.....	5.46	61.89		
Gorham to Orleans.....	25.57	87.46		
Orleans to junction with Canandaigua outlet at Phelps.....	15.21	102.67	395.75	
Phelps to junction with Ganargua creek at Lyons, forming Clyde river.....	48.36	444.11	743.34	
Clyde river.....				
Lyons to junction with Seneca river, foot of Cayuga lake.....	141.11	884.45		884.45
Seneca river.....				
Seneca lake.....				
Keuka lake.....				
Land drainage to outlet.....	160.96			
Water-surface.....	17.51	178.47		
Keuka outlet to Seneca lake.....	24.80	203.27		
Catharine creek.....				
Above Montour Falls.....	66.46		640.93	
Montour Falls to Seneca lake.....	29.91	96.37		
Glen creek.....	23.53	23.53		
Direct lake drainage.....	317.76	317.76		
Water-surface.....	67.16		708.09	
Seneca river, foot of Seneca lake to Waterloo...	40.90		748.99	
Seneca river, Waterloo to Seneca Falls.....	28.55		777.54	
Seneca river, Seneca Falls to Mud lock, foot of Cayuga lake.....	7.52		785.06	
Cayuga lake.....				
Cascadilla creek.....	14.38			
Six-Mile creek.....	59.05			
Buttermilk creek.....	29.16			
Cayuga inlet.....	67.02			
Salmon creek.....	91.13			
Fall creek.....				
Above Freeville.....	58.68			
Virgil creek.....	26.00	84.68		
Freeville to Cornell dam.....	30.62	115.30		
Cornell dam to Cayuga lake.....	1.56	116.86		
Taghanic creek.....				
Above Halseyville.....	56.96			
Halseyville to Taghanic falls.....	10.40	67.36		
Taghanic falls to Cayuga lake.....	0.39	67.75		
Other Cayuga lake drainage.....	275.04	720.39		
Cayuga lake, water-surface.....	66.31	786.70	1,571.76	
Seneca river, Cayuga lake to junction with Clyde river.....	15.42		1,587.18	2,471.63
Seneca river, junction with Clyde river to junction with Owasco outlet.....	146.23			2,617.86

* From U. S. Geological Survey topographic maps.

Drainage areas tributary to SENECA RIVER — *Continued*

LOCALITY	AREA IN SQUARE MILES			
	Place to place	Sub-total	Branch total	General total
<i>Seneca river — Continued.</i>				
Owasco lake.				
Owasco inlet, above Moravia.....	74.33			
Moravia to Owasco lake.....	42.92	117.25		
Direct drainage to lake.....	76.24	193.49		
Foot of lake to State dam.....	0.98	194.47		
Water-surface.....	10.40	204.87		
Owasco outlet to junction with Seneca river..	16.73	221.60		2,839.46
Seneca river, junction with Owasco outlet to junction with Skaneateles outlet.....	98.70			2,938.46
Skaneateles lake.				
Land drainage to foot.....	58.41			
Water-surface.....	14.13	72.54		
Foot of lake to Willow Glen.....	1.84	74.38		
Willow Glen to Seneca river.....	16.69	91.07		3,029.23
Seneca river, Skaneateles outlet to Carpenter brook.....	25.50			3,054.73
Carpenter brook.....	18.70			3,073.43
Seneca river, Carpenter brook to Baldwinsville..	48.10			3,139.33
Seneca river, Baldwinsville to Onondaga outlet.....	17.80			3,121.50
Onondaga lake.				
Otisco lake, land drainage to foot.....	41.40			
Otisco lake, water-surface.....	3.30	44.70		
Nine-Mile creek, Onondaga county (Otisco outlet), to Onondaga lake.....	74.00	118.70		
Onondaga creek.				
Above junction with West brook.....	40.60			
Junction with West brook to inflow to Onondaga lake.....	65.30	105.90		
Other land drainage to Onondaga lake.....	59.10	283.70		
Onondaga lake, water surface.....	4.70	288.40		
Onondaga outlet, lake to Seneca river.....	3.00	291.40		3,430.73
Seneca river, Onondaga outlet to Belgium....	10.12			3,440.85
Seneca river, Belgium to Three River Point....	4.40			3,445.24

Drainage areas tributary to OSWEGO RIVER *

LOCALITY	AREA IN SQUARE MILES		
	Place to place	Total from Three River Point	Total drainage basin
Oneida river, above Three River Point.....			1,492.85
Seneca river, above Three River Point.....			3,445.24
Oswego river, at Three River Point.....			4,938.09
Three River Point to Phoenix.....	2.32	2.32	4,940.41
Phoenix to Hinmansville.....	17.58	19.90	4,957.99
Hinmansville to Ox creek.....	17.05	36.95	4,975.04
Ox creek.....	33.68	70.63	5,008.72
Ox creek to upper dam, Fulton.....	9.15	79.78	5,017.87
Fulton to Neatahwanta creek.....	9.15	88.93	5,027.02
Neatahwanta creek.....	21.92	110.85	5,048.94
Neatahwanta creek to Black creek.....	1.01	111.83	5,049.95
Black creek.....	37.93	149.79	5,087.88
Black creek to Battle Island.....	0.92	150.71	5,088.80
Battle Island to Minetto.....	2.11	152.82	5,090.91
Minetto to High dam.....	4.87	157.69	5,095.78
High dam to Oswego dam.....	1.22	158.91	5,097.00
Oswego dam to Lake Ontario.....	1.21	160.12	5,098.21

* From U. S. Geological Survey topographic maps.

OSWEGO RIVER

DESCRIPTION

The river is canalized for practically its entire length by the Barge canal improvement and almost all of the 118.6 feet drop between canal pool at Three River Point and low water in Lake Ontario occurs at six dams, all having bulkhead gates for power purposes, the upper two of which have large Taintor gates for surface regulation.

OSWEGO RIVER AT MINETTO

Gages Nos. 171 and 172

At Minetto a new curved dam (No. 5) with fixed concrete ogee crest 500 feet long at elevation 308.0, radius 192 feet, has been built immediately above the old straight dam, crest elevation 297.3, which has been removed. Water first flowed over new crest October 5, 1914.

Location.—In the village of Minetto at dam No. 5, about five miles above the mouth of the Oswego river.

Drainage area.—5,091 square miles. (Measured on U. S. Geological Survey topographic maps.)

Records available.—Water-surface elevations above and below old and new dam, April 18, 1904, to June 30, 1921. Discharge, October 1, 1914, to June 30, 1921.

Gages.—Above dam, staff at the end of upper east gate recess of lock No. 5.

Below dam, staff on the end of the lower west approach wall to lock No. 5.

Control.—Crest of dam, Barge canal lock No. 5 and power-plant of the Northern New York Power Company.

Extremes of discharge.—1915–1921: Maximum stage recorded elevation, 313.35, April 5, 1916; discharge, 30,900 second-feet. Minimum stage recorded, September 1, 1918; discharge, 350 second-feet.

Regulation.—By the large number of lakes in the drainage area and by poundage at Fulton and Phoenix.

Accuracy.—It is believed that the water passed through the wheels is somewhat underestimated, due to the lack of actual tests of wheels in place. Flow over crest and through power-wheels calculated from hourly readings. Discharge over dam from theoretical curve prepared by this Department. Water used for canal purposes estimated by this Department.

Coöperation.—Discharge records of flow over dam and through wheels furnished by the Niagara, Lockport and Ontario Power Company, lessee.

REPORT OF STATE ENGINEER

Daily elevation of water-surface (B. C. Datum) of OSWEGO RIVER ABOVE DAM AT MINETTO, for the year ended June 30, 1921

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	308.00	308.00	308.05	308.0	308.05	308.1	308.05	308.05	308.4	309.4	308.1	308.05
2.....	308.05	308.05	308.00	308.0	308.15	308.5	308.1	308.05	308.4	309.35	308.05	308.0
3.....	308.00	308.00	308.00	308.0	308.1	309.3	308.8	308.0	308.6	309.5	308.05	308.0
4.....	308.00	308.00	308.00	308.05	308.1	309.8	308.85	308.0	308.7	309.4	308.0	308.0
5.....	308.00	308.05	307.95	308.05	308.0	309.55	308.9	308.0	309.5	308.6	308.0	308.05
6.....	308.05	308.00	308.00	308.0	308.05	309.9	309.2	308.0	308.45	308.25	308.05	308.15
7.....	308.00	308.25	307.90	308.1	308.0	309.7	308.8	308.35	309.65	308.2	308.1	308.05
8.....	308.00	308.00	307.95	308.05	308.0	309.55	308.7	308.1	310.6	308.05	308.1	307.9
9.....	308.00	308.00	307.85	308.05	308.1	308.95	308.3	308.2	310.55	308.15	308.05	308.1
10.....	308.05	308.00	307.95	308.15	308.1	308.95	308.45	308.1	310.65	307.9	308.05	308.0
11.....	308.00	308.05	308.00	308.0	308.05	308.8	308.0	308.2	310.8	308.1	308.0	308.0
12.....	308.00	308.05	308.00	308.05	308.0	308.25	308.0	308.25	310.65	307.95	308.0	308.0
13.....	308.00	308.00	308.15	308.05	308.2	308.8	309.25	308.05	310.45	308.35	308.15	308.1
14.....	308.00	308.05	308.00	308.05	308.0	309.25	308.0	308.15	310.7	308.4	308.15	308.0
15.....	308.10	308.05	308.10	308.0	308.0	309.2	308.05	308.05	310.4	308.5	308.1	308.0
16.....	308.00	308.00	308.00	308.05	308.1	309.35	308.05	308.05	310.25	308.05	308.05	308.0
17.....	308.00	308.00	308.00	308.05	308.0	309.35	308.25	308.15	310.15	308.05	308.0	308.0
18.....	308.00	308.05	308.05	308.0	308.0	309.3	308.05	308.75	310.3	308.2	308.0	308.0
19.....	308.00	308.05	308.00	308.0	308.05	309.3	308.05	309.05	310.5	308.0	307.95	308.05
20.....	308.20	308.00	308.00	308.0	308.1	309.3	308.05	308.45	310.85	308.25	308.0	308.0
21.....	308.10	308.00	308.00	308.0	308.0	308.8	308.0	308.85	310.45	308.05	308.0	308.0
22.....	308.10	308.00	308.05	308.05	308.05	308.65	308.1	308.15	310.45	308.15	308.0	308.0
23.....	308.10	308.00	308.05	308.0	308.15	308.85	308.15	308.15	310.55	308.05	308.05	308.0
24.....	308.00	308.00	308.00	308.0	308.25	308.65	308.2	308.15	310.45	308.0	308.05	308.05
25.....	308.00	308.00	308.05	308.05	308.4	308.65	308.0	308.25	310.2	308.8	308.0	308.05
26.....	308.05	308.00	308.10	308.05	308.95	308.25	308.0	308.15	310.0	308.75	308.0	308.05
27.....	308.15	308.00	308.00	308.0	308.55	308.1	308.0	307.95	309.7	310.15	308.0	308.0
28.....	308.00	308.05	308.00	308.1	307.95	308.1	308.05	308.25	309.95	308.2	308.05	308.0
29.....	308.00	308.00	308.10	308.0	308.2	308.2	308.05	309.5	309.5	308.25	308.15	308.1
30.....	308.05	308.05	308.05	308.05	308.1	308.25	308.15	309.6	308.2	308.0	308.05	308.05
31.....	308.15	308.00	.....	308.05	.....	308.1	308.05	.....	309.45	.....	307.95	.....

Daily elevation of water-surface (B. C. Datum) of OSWEGO RIVER BELOW DAM AT MINETTO, for the year ended June 30, 1921

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	291.60	291.10	291.30	291.4	291.2	292.8	292.95	292.15	293.15	293.7	292.25	291.55
2.....	291.25	290.90	291.40	291.3	291.5	293.1	292.9	292.35	293.15	293.65	292.6	291.7
3.....	291.45	291.25	291.30	291.2	291.35	293.65	293.4	292.25	293.25	293.65	292.35	291.5
4.....	291.10	291.50	291.30	291.6	291.3	293.95	293.4	292.4	293.25	293.75	292.35	291.25
5.....	290.85	291.05	290.75	291.6	291.25	293.6	293.4	292.15	293.4	293.25	292.4	291.35
6.....	291.10	291.45	290.70	291.6	291.25	294.0	293.35	292.1	293.4	293.05	292.2	291.65
7.....	291.40	291.15	290.95	291.5	291.1	293.95	293.3	292.45	293.85	292.85	292.1	291.55
8.....	291.50	291.15	291.10	291.5	291.35	293.8	293.25	292.4	294.25	292.8	291.85	291.25
9.....	291.45	291.50	291.15	291.35	291.55	293.4	293.15	292.45	294.55	292.25	292.35	291.6
10.....	291.35	291.40	291.30	290.9	291.3	293.45	293.1	292.4	294.7	292.05	292.1	291.45
11.....	290.95	291.45	291.20	291.7	291.2	293.35	292.95	292.7	294.8	292.85	292.05	291.3
12.....	291.20	291.45	290.75	291.5	291.15	293.0	292.8	292.45	294.65	292.3	292.1	291.15
13.....	291.40	291.50	291.40	291.3	290.95	293.25	292.8	291.95	294.5	292.45	292.0	291.15
14.....	291.40	291.25	291.90	291.25	291.0	293.55	292.7	292.55	294.65	292.2	292.1	291.25
15.....	291.15	291.30	291.90	291.3	291.25	293.65	292.5	292.35	294.5	292.65	292.0	291.55
16.....	291.45	291.30	291.50	291.2	291.4	293.7	292.35	292.4	294.35	292.2	292.2	291.35
17.....	291.20	291.55	291.35	290.7	291.45	293.7	292.7	292.8	294.3	291.9	292.0	291.55
18.....	291.15	291.35	291.25	291.15	291.6	293.65	292.2	293.3	294.45	292.7	291.95	291.05
19.....	291.55	291.45	290.75	291.2	291.65	293.6	292.4	292.4	294.55	292.7	291.75	291.05
20.....	291.60	291.45	291.05	291.45	291.7	293.7	292.7	293.15	294.35	292.4	291.7	291.3

Daily elevation of water-surface (B. C. Datum) of OSWEGO RIVER BELOW DAM AT MINETTO, for the year ended June 30, 1921 — *Concluded*

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
21.	291.65	291.45	291.25	291.5	291.45	293.4	292.65	293.5	294.5	292.75	291.7	291.35
22.	291.55	291.20	291.05	291.4	292.35	293.35	292.6	292.85	294.55	292.35	291.45	291.35
23.	291.75	291.15	291.20	291.15	292.3	293.4	292.7	292.75	294.55	292.3	291.8	291.3
24.	291.55	291.15	291.15	291.05	292.95	293.35	292.65	292.55	294.5	292.7	291.85	291.25
25.	291.05	291.55	290.65	291.15	293.05	293.35	292.65	292.75	294.3	293.25	291.9	290.85
26.	291.30	291.50	290.95	291.1	293.3	293.15	292.7	292.6	294.15	293.35	291.7	291.0
27.	291.55	291.50	291.10	291.2	293.15	292.85	292.6	292.45	293.95	293.35	291.75	291.2
28.	291.55	291.45	291.35	291.15	292.85	292.65	292.6	292.75	294.15	292.7	291.75	291.4
29.	291.45	291.25	291.25	291.3	292.7	292.8	292.4	.....	294.0	292.75	291.45	291.4
30.	291.45	290.95	291.35	290.9	292.85	293.05	292.1	.....	293.95	292.5	291.7	291.5
31.	291.35	291.25	.....	290.9	.....	293.05	292.5	.....	293.75	.....	291.75	.....

Daily discharge of OSWEGO RIVER AT MINETTO, for the year ending June 30, 1921

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.	1,930	1,120	1,740	1,880	1,810	5,740	6,070	4,020	6,820	9,510	3,860	2,840
2.	1,940	1,520	1,640	2,150	1,990	6,960	5,860	4,420	7,190	9,640	5,130	2,820
3.	1,850	1,780	1,680	1,320	1,900	9,370	7,800	3,990	6,680	9,910	4,520	2,700
4.	1,050	1,710	1,180	2,460	1,860	10,330	7,950	4,010	7,250	9,090	4,530	2,220
5.	805	1,860	441	2,360	1,710	9,810	8,040	3,900	8,210	7,290	4,520	1,630
6.	1,480	1,670	385	2,590	1,780	11,340	7,850	3,350	7,720	6,160	4,300	2,710
7.	2,160	1,630	711	1,680	1,120	11,000	7,450	4,760	9,540	5,760	3,720	2,600
8.	2,120	1,110	1,780	2,130	1,920	9,720	7,160	4,520	12,730	5,020	2,900	2,050
9.	1,940	1,730	1,470	1,810	2,200	8,490	6,630	4,460	14,290	4,630	4,220	2,390
10.	1,830	1,690	1,120	1,030	1,810	8,440	6,750	4,630	14,270	3,690	3,760	2,170
11.	947	1,790	934	1,880	1,700	7,920	7,710	4,980	15,330	5,150	3,380	1,980
12.	1,530	1,960	653	1,980	1,160	6,710	5,490	4,660	15,650	4,700	3,510	1,110
13.	1,990	1,780	1,980	2,010	1,200	7,430	5,940	3,680	13,870	4,380	3,620	2,040
14.	1,880	1,790	2,350	1,690	1,100	9,010	5,270	4,780	16,430	4,180	3,500	1,630
15.	1,490	1,360	2,160	1,440	2,040	9,400	5,130	4,680	12,450	4,900	2,740	1,880
16.	1,600	1,700	1,700	1,600	1,650	9,760	4,500	4,470	14,550	4,110	3,620	1,670
17.	1,700	1,770	2,240	1,020	2,230	9,780	4,530	5,610	13,100	2,840	3,610	1,790
18.	1,000	1,860	1,580	1,270	2,600	9,890	3,560	7,120	13,610	5,160	3,390	1,620
19.	1,990	1,730	795	1,560	2,990	9,940	4,150	8,720	15,260	4,410	3,070	1,190
20.	2,490	1,470	1,390	1,750	2,970	9,450	4,540	7,430	14,710	4,660	2,880	1,480
21.	2,470	1,860	1,330	1,920	2,430	7,700	4,780	7,350	13,020	4,780	2,820	1,830
22.	2,230	1,190	1,480	1,780	4,280	7,640	5,170	5,530	13,610	4,600	1,870	1,720
23.	2,160	1,490	1,500	1,410	4,770	7,760	5,280	5,410	13,930	4,500	3,350	1,620
24.	2,410	1,440	1,200	800	6,210	8,100	5,470	5,160	12,990	5,320	3,180	1,510
25.	902	1,780	1,440	1,380	6,480	7,230	4,770	5,120	10,680	7,010	2,700	1,230
26.	1,870	1,810	532	1,410	7,860	6,000	4,780	5,280	10,910	7,900	2,360	801
27.	2,300	1,560	1,390	1,470	6,560	5,700	4,730	4,820	10,550	7,110	2,410	1,520
28.	2,090	1,720	1,630	1,260	5,970	5,430	4,590	5,720	10,420	5,710	2,810	2,170
29.	1,846	1,010	1,640	1,730	5,680	5,960	4,510	.....	10,200	5,000	1,650	1,300
30.	1,846	1,160	1,930	1,290	6,150	6,780	4,250	.....	10,420	4,810	3,000	1,700
31.	1,650	1,630	.....	920	.....	6,350	4,400	.....	10,070	.....	2,720	.....

Monthly discharge of OSWEGO RIVER AT MINETTO, for the year ending June 30, 1921
[Drainage area, 5,091 square miles]

MONTH	DISCHARGE IN SECOND-FEET				RUN-OFF
	Maximum	Minimum	Mean	Per square mile	Depth in inches on drainage area
July.....	2,490	805	1,790	.352	.407
August.....	1,960	1,010	1,600	.314	.362
September.....	2,350	385	1,400	.275	.307
October.....	2,590	800	1,640	.322	.372
November.....	7,860	1,100	3,140	.617	.689
December.....	11,340	5,430	8,230	1.615	1.865
January.....	8,040	3,560	5,650	1.110	1.280
February.....	8,720	3,350	5,090	1.000	1.040
March.....	16,430	6,680	11,820	2.325	2.680
April.....	9,640	2,840	5,710	1.122	1.252
May.....	5,130	1,650	3,340	.656	.757
June.....	2,840	801	1,870	.368	.411
The year.....	16,430	385	4,270	.840	11.422

OSWEGO RIVER AT NEW HIGH DAM, OSWEGO

Gages Nos. 169 and 170

High dam (old) with fixed crest at about elevation 281.8 has been removed above elevation 268.0, having been submerged by the pool formed by new High dam (dam No. 6) located about a mile farther downstream with fixed concrete ogee crest 500 feet long at elevation 290.0. The new pool was filled January 7, 1915.

Location.—At Barge canal dam No. 6, known as new High dam, just south of the city of Oswego and about 2 miles above the mouth of the Oswego river.

Drainage area.—5,097 square miles. (Measured on U. S. Geological Survey topographic maps.)

Records available.—Water-surface elevation above and below, January 1, 1915, to June 30, 1921. Discharge, January 7, 1915, to June 30, 1921.

Gages.—Above dam, 7-day Gurley graph recorder.

Below dam, staff on wing of lower approach wall to lock No. 6.

Control.—Crest of dam, Barge canal lock No. 6 and bulkhead gates.

Extremes of discharge.—1915–1921: Maximum stage recorded, elevation 296.3 on April 3, 4 and 5, 1916; discharge, 31,400 second-feet. Minimum stage recorded, elevation 287.2 on December 16, 1915, at 10 A. M.

Regulation.—By the large number of lakes in the drainage area and by pondage at Fulton and Phoenix.

Accuracy.—Except for the small amount required for canal purposes, the entire flow of the river passes over the dam. Rating curve for dam is theoretical, based on experiments taken at similar structures. Current meter measurements now being taken above dam to check this curve. Amount of water used by canal estimated from number of lockages and amount of power used.

Coöperation.—Station maintained by this Department. Gages read by employees of the Department of Public Works.

Mean daily elevation of water-surface of OSWEGO RIVER ABOVE NEW HIGH DAM
for the year ending June 30, 1921

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1	291.45	291.02	291.27	291.37	291.39	292.66	292.75	292.13	292.94	293.40	292.21	291.68
2	291.43	291.20	291.25	291.45	291.48	292.93	292.72	292.21	292.97	293.49	292.54	291.67
3	291.36	291.32	291.19	291.04	291.39	293.36	293.12	292.13	293.04	293.50	292.35	291.66
4	291.02	291.29	291.00	291.50	291.37	293.65	293.15	292.08	293.02	293.40	292.39	291.53
5	290.88	291.35	290.63	291.44	291.33	293.55	293.15	292.12	293.10	293.02	292.35	291.25
6	291.22	291.30	290.57	291.35	291.38	293.71	293.13	291.90	293.06	292.81	292.29	291.80
7	291.48	291.28	290.76	291.37	291.04	293.62	293.12	292.33	293.45	292.68	292.13	291.69
8	291.46	290.99	291.28	291.42	291.37	293.35	293.05	292.31	293.72	292.42	291.70	291.48
9	291.38	291.28	291.11	291.36	291.53	293.20	292.94	292.22	294.15	292.25	292.28	291.62
10	291.35	291.22	290.94	290.97	291.32	293.24	292.94	292.28	294.22	292.01	292.19	291.55
11	290.95	291.32	290.87	291.33	291.27	293.13	292.83	292.40	294.22	292.46	292.04	291.44
12	291.12	291.41	290.78	291.40	291.00	292.96	292.59	292.35	294.20	292.35	292.08	291.10
13	291.40	291.34	291.34	291.40	291.04	293.10	292.40	292.04	294.16	292.25	292.08	291.43
14	291.35	291.31	291.50	291.26	290.99	293.28	292.52	292.35	294.19	292.13	292.03	291.33
15	291.22	291.09	291.43	291.16	291.37	293.38	292.51	292.31	294.04	292.30	291.78	291.37
16	291.27	291.28	291.41	291.19	291.21	293.42	292.36	292.24	293.95	292.10	292.23	291.35
17	291.30	291.35	291.29	290.88	291.45	293.43	292.32	292.60	293.87	291.75	292.00	291.38
18	291.03	291.35	291.18	291.03	291.60	293.41	291.99	292.98	293.96	292.36	291.98	291.31
19	291.39	291.29	290.86	291.12	291.73	293.43	292.17	293.24	294.08	292.39	291.90	291.06
20	291.63	291.34	291.14	291.23	291.79	293.37	292.29	293.09	294.16	292.36	291.83	291.29
21	291.61	291.36	291.27	291.26	291.60	293.10	292.40	293.07	294.11	292.47	291.79	291.42
22	291.56	291.05	291.18	291.23	292.23	293.07	292.45	292.78	294.13	292.37	291.45	291.37
23	291.50	291.20	291.22	291.13	292.42	293.08	292.47	292.57	294.19	292.31	291.95	291.35
24	291.47	291.20	291.16	290.87	292.83	293.17	292.55	292.50	294.11	292.56	291.90	291.25
25	291.08	291.29	290.97	291.15	292.95	293.04	292.30	292.48	293.97	292.97	291.77	291.06
26	291.35	291.31	290.80	291.18	293.08	292.94	292.36	292.58	293.86	293.16	291.61	290.94
27	291.53	291.24	291.19	291.21	293.06	292.68	292.31	292.42	293.74	293.14	291.59	291.24
28	291.41	291.35	291.29	291.11	292.85	292.53	292.27	292.63	293.64	292.72	291.77	291.42
29	291.37	290.95	291.28	291.32	292.69	292.77	292.26	.....	293.61	292.52	291.31	291.42
30	291.37	290.99	291.26	291.15	292.78	292.87	292.18	.....	293.58	292.43	291.72	291.38
31	291.28	291.27	.....	290.96	.....	292.80	292.29	.....	293.44	.....	291.71	.....

Daily elevation of water-surface (B. C. Datum) of Oswego River below New High DAM, OSWEGO, for the year ended June 30, 1921

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	269.10	269.25	269.35	270.45	270.35	270.55	270.9	269.95	270.8	271.5	270.1	269.65
2.....	268.50	268.38	269.75	270.55	270.3	270.8	270.9	270.25	270.95	271.65	271.0	269.55
3.....	269.35	268.90	269.50	270.45	269.95	271.4	271.25	270.1	271.05	271.6	270.35	268.85
4.....	269.00	269.40	270.00	270.4	270.05	271.75	271.2	270.1	271.1	271.65	270.3	269.4
5.....	268.35	267.25	268.55	270.1	270.5	272.0	271.2	270.15	271.25	271.15	270.45	269.0
6.....	267.40	269.50	269.15	270.15	270.6	271.75	271.25	270.25	a	270.9	270.1	270.1
7.....	268.80	268.30	269.10	270.25	269.95	271.6	271.1	270.25	a	270.7	270.1	269.4
8.....	268.50	269.80	270.05	270.1	270.7	271.35	271.15	270.25	a	270.75	269.95	268.35
9.....	238.60	270.30	269.55	270.15	270.8	271.1	271.2	270.22	a	270.1	270.45	269.5
10.....	238.90	269.80	270.25	269.5	270.4	271.35	270.85	270.25	a	269.85	270.1	269.25
11.....	268.90	269.15	270.05	270.7	270.05	271.2	270.8	270.6	272.85	270.8	269.95	269.2
12.....	268.80	269.95	270.30	270.35	269.95	271.2	270.55	270.4	272.85	270.15	269.85	269.25
13.....	269.10	270.05	270.00	269.9	270.05	271.0	270.45	270.15	272.6	270.4	270.0	269.25
14.....	238.45	269.90	270.75	270.0	270.05	271.15	270.7	270.25	272.6	270.0	270.05	269.25
15.....	266.70	270.50	270.50	269.7	270.65	271.4	271.05	270.2	272.4	270.5	270.05	270.15
16.....	268.15	269.25	269.75	269.7	270.72	271.5	270.55	270.1	272.3	270.1	270.55	269.4
17.....	268.70	269.75	270.10	269.5	270.9	271.4	270.3	270.5	272.3	270.08	270.05	270.55
18.....	268.25	268.45	270.00	269.25	271.0	271.5	269.8	271.1	272.35	270.5	270.05	270.4
19.....	269.10	269.55	269.90	270.05	271.25	271.5	270.0	271.35	272.45	270.45	269.75	269.8
20.....	269.10	270.00	268.70	270.35	271.2	271.45	270.05	271.2	272.65	270.15	269.75	269.0
21.....	269.25	270.25	269.20	270.3	270.25	271.2	270.3	271.15	272.3	270.45	269.75	270.05
22.....	269.05	270.30	269.35	270.4	270.25	271.2	270.35	270.85	272.3	270.15	269.6	269.9
23.....	269.55	268.50	269.70	269.3	270.15	271.2	270.75	270.4	272.4	270.25	270.05	268.8
24.....	269.45	267.35	268.40	269.95	270.8	271.15	270.6	270.3	272.3	270.7	269.8	269.45
25.....	269.30	270.00	267.75	269.75	271.2	271.2	270.35	270.5	272.2	271.05	269.55	268.85
26.....	269.15	270.40	269.30	269.1	271.2	271.0	270.45	270.5	272.15	271.2	269.6	269.85
27.....	269.60	269.05	269.55	269.6	271.15	270.7	270.35	270.45	272.0	271.15	269.55	268.4
28.....	269.20	270.35	270.30	268.05	271.0	270.65	270.4	270.6	272.0	270.75	269.95	269.95
29.....	268.95	270.25	270.00	270.3	270.5	270.85	270.45	.....	271.65	270.5	269.55	269.55
30.....	268.15	267.00	270.05	269.7	270.55	271.1	270.0	.....	271.75	270.4	270.25	270.2
31.....	268.45	269.70	.....	268.7	.....	271.1	270.15	.....	271.6	.....	269.75	.....

a No record.

Daily discharge, in second-feet, of OSWEGO RIVER AT HIGH DAM for the year ending June 30, 1921

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	3,170	1,810	2,570	2,910	2,970	8,340	8,790	5,860	9,770	12,300	6,220	4,020
2.....	3,110	2,340	2,510	3,180	3,290	9,710	8,640	6,210	9,920	12,800	7,750	3,970
3.....	2,870	2,730	2,320	1,870	2,980	12,000	10,700	5,860	10,300	12,800	6,850	3,940
4.....	1,800	2,630	1,760	3,360	2,910	13,700	10,900	5,640	10,200	12,300	7,040	3,460
5.....	1,420	2,840	840	3,150	2,780	13,100	10,900	5,820	10,600	10,200	6,860	2,510
6.....	2,400	2,660	700	2,840	2,940	14,100	10,800	4,880	10,400	9,090	6,580	4,480
7.....	3,290	2,600	1,110	2,910	1,870	13,500	10,700	6,760	12,500	8,440	5,870	4,060
8.....	3,210	1,720	2,600	3,080	2,910	12,000	10,300	6,670	14,100	7,180	4,090	3,280
9.....	2,930	2,600	2,060	2,880	3,470	11,200	9,760	6,260	16,700	6,390	6,530	3,790
10.....	2,820	2,410	1,570	1,670	2,740	11,400	9,770	6,530	17,100	5,340	6,130	3,530
11.....	1,600	2,730	1,390	2,780	2,580	10,800	9,200	7,080	17,100	7,370	5,470	3,130
12.....	2,090	3,040	1,160	3,010	1,750	9,870	7,990	6,850	17,000	6,850	5,640	2,040
13.....	3,000	2,790	2,790	3,010	1,870	10,600	7,080	5,470	16,700	6,390	5,650	3,100
14.....	2,830	2,710	3,360	2,540	1,730	11,600	7,650	6,850	16,900	5,860	5,430	2,770
15.....	2,400	2,000	3,120	2,230	2,910	12,200	7,610	6,670	16,000	6,620	4,410	2,890
16.....	2,560	2,600	3,040	2,320	2,390	12,400	6,900	6,350	15,500	5,730	6,300	2,620
17.....	2,660	2,830	2,630	1,430	3,180	12,400	6,710	8,040	15,000	4,280	5,300	2,930
18.....	1,830	2,830	2,280	1,840	3,730	12,300	5,280	9,070	15,500	6,900	5,220	2,700
19.....	2,960	2,640	1,360	2,110	4,230	12,400	6,040	11,400	18,300	7,040	4,900	1,980
20.....	3,830	2,800	2,150	2,440	4,450	12,100	6,570	10,600	16,800	6,900	4,600	2,620

Daily discharge, in second-feet, of OSWEGO RIVER AT HIGH DAM for the year ending
June 30, 1921 — *Continued*

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
21.....	3,750	2,870	2,560	2,540	3,720	10,600	7,080	10,500	16,400	7,420	4,440	3,070
22.....	3,570	1,890	2,280	2,450	6,320	10,500	7,320	8,940	16,600	6,940	3,170	2,920
23.....	3,340	2,340	2,400	2,140	7,190	10,500	7,410	7,900	16,900	6,670	5,090	2,840
24.....	3,240	2,340	2,200	1,400	9,210	11,000	7,800	7,560	16,400	7,850	4,880	2,500
25.....	1,970	2,630	1,650	2,200	9,830	10,300	6,620	7,460	15,600	9,920	4,370	1,920
26.....	2,830	2,700	1,210	2,290	10,500	9,760	6,900	7,940	14,900	10,900	3,760	1,570
27.....	3,470	2,470	2,310	2,380	10,400	8,440	6,670	7,180	14,200	10,800	3,680	2,460
28.....	3,040	2,840	2,630	2,070	9,320	7,700	6,480	8,190	13,600	8,640	4,370	3,060
29.....	2,900	1,600	2,600	2,740	8,500	8,390	6,440	.....	13,500	7,650	2,690	3,070
30.....	2,890	1,710	2,530	2,200	8,960	9,400	6,080	.....	13,300	7,230	4,180	2,930
31.....	2,610	2,560	.....	1,640	.....	9,040	6,570	.....	12,500	.....	4,140	.....

Monthly Discharge of OSWEGO RIVER AT NEW HIGH DAM, for the year ending June
30, 1921

[Drainage area, 5,097 square miles]

MONTH	DISCHARGE IN SECOND-FEET				RUN-OFF
	Maximum	Minimum	Mean	Per square mile	Depth in inches on drainage area
July.....	3,830	1,420	2,700	.546	.630
August.....	2,870	1,600	2,490	.488	.563
September.....	3,360	700	2,120	.416	.464
October.....	3,360	1,400	2,440	.478	.551
November.....	10,500	1,730	4,720	.926	1.03
December.....	14,100	7,700	11,000	2.160	2.490
January.....	10,900	5,260	7,990	1.57	1.81
February.....	11,400	4,880	7,340	1.44	1.50
March.....	17,100	9,770	14,500	2.84	3.27
April.....	12,800	4,280	8,160	1.60	1.78
May.....	7,750	2,690	5,210	1.02	1.18
June.....	4,480	1,570	3,000	.589	0.657
The year.....	17,100	7.0	5,980	1.17	15.9

OSWEGO RIVER BELOW LOCK No 8, OSWEGO

Gage No. 166

Location.— Below lock No. 8 at the mouth of the Oswego river.

Records available.— January, 1914, to June 30, 1921.

Gage.— Staff on the end of lower east approach wall of lock No. 8.

Discharge.— No discharge obtained.

Accuracy.— Gage read to tenths, four times a day from July 1 to November 20 and twice a day for balance of year.

Coöperation.— Station established by this Department. Gage read by employees of the Department of Public Works.

**Daily elevation of water-surface of OSWEGO RIVER BELOW LOCK No. 8, AT OSWEGO
for the year ended June 30, 1921**

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb	Mar.	April	May	June
1	246.68	246.80	246.68	246.57	246.35	246.3	246.7	246.8	246.65	247.45	247.8	247.8
2	246.70	246.80	246.70	246.57	246.3	246.5	246.8	246.7	246.55	247.4	247.9	247.8
3	246.70	246.72	246.68	246.53	246.4	246.4	246.8	246.7	246.7	247.5	247.9	247.75
4	246.75	246.70	246.60	246.63	246.4	246.4	246.8	246.65	246.8	247.5	247.9	247.8
5	246.78	246.68	246.60	246.65	246.4	246.55	246.9	246.6	246.55	247.5	247.8	247.7
6	246.70	246.65	246.55	246.57	246.37	246.65	246.9	246.6	246.65	247.4	247.85	247.65
7	246.65	246.65	246.60	246.47	246.33	246.6	246.75	246.6	246.7	247.4	247.8	247.7
8	246.72	246.62	246.60	246.47	246.3	246.6	246.75	246.6	246.75	247.35	247.85	247.55
9	246.70	246.62	246.58	246.5	246.33	246.6	246.8	246.55	247.0	247.4	247.8	247.6
10	246.75	246.62	246.60	246.5	246.4	246.5	246.75	246.6	247.0	247.45	247.8	247.6
11	246.72	246.70	246.58	246.47	246.35	246.45	246.75	246.65	247.0	247.4	247.75	247.7
12	246.72	246.68	246.60	246.47	246.37	246.5	246.9	246.55	247.1	247.4	247.75	247.7
13	246.65	246.70	246.62	246.47	246.43	246.45	246.8	246.6	247.15	247.5	247.7	247.7
14	246.65	246.65	246.60	246.47	246.4	246.55	246.8	246.8	247.2	247.45	247.7	247.8
15	246.65	246.60	246.62	246.4	246.4	246.5	246.8	246.6	246.95	247.5	247.8	247.8
16	246.78	246.62	246.65	246.37	246.4	246.5	246.85	246.6	247.2	247.6	247.8	247.7
17	246.68	246.60	246.72	246.37	246.43	246.65	246.9	246.6	247.1	247.5	247.8	247.7
18	246.68	246.65	246.75	246.35	246.43	246.8	246.9	246.65	247.1	247.6	247.8	247.45
19	246.65	246.60	246.72	246.37	246.4	246.6	246.8	246.6	246.9	247.6	247.8	247.6
20	246.62	246.60	246.58	246.35	246.4	246.6	246.7	246.6	247.05	247.55	247.8	247.5
21	246.75	246.58	246.55	246.3	a	246.55	246.7	246.6	247.2	247.5	247.8	247.5
22	246.75	246.68	246.60	246.37	246.1	246.55	246.7	246.6	247.3	247.65	247.8	247.5
23	246.72	246.68	246.50	246.35	246.3	246.8	246.9	246.65	247.3	247.6	247.8	247.55
24	246.90	246.70	246.45	246.3	246.4	246.75	246.9	246.65	247.15	247.8	247.7	247.6
25	246.88	246.68	246.48	246.3	246.4	246.5	246.85	246.6	247.3	247.8	247.7	247.5
26	246.80	246.62	246.48	246.25	246.45	246.55	246.9	246.45	247.1	247.85	247.8	247.6
27	246.72	246.62	246.45	246.27	246.35	246.6	246.7	246.5	247.2	247.75	247.6	247.5
28	246.75	246.62	246.48	246.33	246.35	246.75	246.7	246.65	247.55	247.7	247.7	247.45
29	246.80	246.62	246.50	246.35	246.3	246.65	246.7	.....	247.35	247.7	247.75	247.4
30	246.80	246.58	246.58	246.45	246.3	246.7	246.8	.....	247.25	247.8	247.75	247.5
31	246.80	246.58	.....	246.45	.....	246.7	246.8	.....	247.45	.....	247.65	.....

a No record.

SENECA RIVER BASIN DESCRIPTION

Seneca river receives the run-off from nine of the finger lakes, the largest of which are Cayuga, Seneca, Keuka, Canandaigua and Onondaga.

SENECA RIVER DESCRIPTION

The stream designated as Seneca river originates at the outlet of Seneca lake, flows easterly into the foot of Cayuga lake and then northeasterly to Three River Point, where it joins Oneida river, forming Oswego river. This river has been canalized for the Barge canal throughout its entire length. The construction of five dams and the necessary dredging has resulted in a series of navigable pools having low navigable water-surfaces referred to Barge canal datum as follows:

Above Three River Point, due to the dam at Phoenix on the Oswego river, Elev. 363.0; above Baldwinsville, Elev. 374.0; above foot of Cayuga lake, Elev. 381.5; above Seneca Falls, Elev. 430.5; above Waterloo, Elev. 445.0.

SENECA RIVER AT WATERLOO

Gage No. 251

Location.—Above lock No. 4 in the village of Waterloo.

Records available.—June 1, 1915, to June 30, 1916, and June 17, 1917, to June 30, 1921.

Gage.—Staff at end of the upper north gate recess of lock No. 4.

Discharge.—No discharge obtained.

Accuracy.—Gage read twice daily to tenths.

Coöperation.—Station established by this Department. Gage read by employees of the Department of Public Works.

Daily elevation of water surface (B. C. Datum) of SENECA RIVER ABOVE LOCK No. 4, WATERLOO, for the year ended June 30, 1921

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	444.55	444.9	444.75	444.75	444.4	444.95	445.4	444.8	444.95	446.25	446.3	446.05
2.....	444.55	444.8	444.7	444.80	444.45	445.2	445.15	444.8	445.05	446.35	446.3	446.0
3.....	444.65	444.8	444.7	444.80	444.5	445.25	445.35	444.7	445.0	446.25	446.2	446.05
4.....	444.65	444.8	444.7	444.80	444.4	445.2	445.15	444.6	445.0	446.35	446.2	446.05
5.....	444.55	444.8	444.75	444.70	444.5	445.25	445.1	444.65	445.0	446.3	446.15	446.05
6.....	444.4	444.85	444.8	444.65	444.45	445.35	445.15	444.75	445.1	446.3	446.3	446.0
7.....	444.6	444.75	444.8	444.70	444.35	445.25	445.1	444.6	445.1	446.3	446.25	446.0
8.....	444.55	444.9	444.7	444.70	444.35	445.2	445.3	444.7	445.4	446.2	446.3	445.9
9.....	444.6	444.85	444.75	444.55	444.4	445.35	445.3	444.5	445.4	446.35	446.25	445.8
10.....	444.55	444.8	444.7	444.80	444.35	445.35	445.2	444.6	445.35	446.3	446.25	445.8
11.....	444.7	444.9	444.6	444.65	444.35	445.25	445.1	444.5	445.4	446.25	446.2	445.9
12.....	444.6	444.8	444.75	444.7	444.3	445.25	445.0	444.75	445.55	446.2	446.25	445.95
13.....	444.6	444.9	444.75	444.7	444.3	445.25	444.9	444.8	445.7	446.25	446.2	445.8
14.....	444.7	444.85	444.75	444.65	444.25	445.3	445.15	444.75	445.65	446.1	446.3	445.7
15.....	444.65	4 4.9	444.8	444.65	444.25	445.4	445.2	444.65	445.6	446.15	446.25	445.8
16.....	444.6	444.95	444.8	444.8	444.15	445.25	445.3	444.75	445.7	446.1	446.15	445.6
17.....	444.6	444.95	444.75	444.7	444.3	445.4	445.1	444.95	445.55	446.25	446.1	445.7
18.....	444.7	444.9	444.85	444.65	444.3	445.35	444.85	444.9	445.6	446.2	446.15	445.7
19.....	444.7	444.95	444.7	444.65	444.3	445.3	444.85	444.9	445.85	446.25	446.15	445.9
20.....	444.65	445.0	444.65	444.65	444.25	445.2	445.1	444.95	445.95	446.15	446.15	445.65
21.....	444.7	444.95	444.65	444.65	444.5	445.35	444.9	444.9	446.0	446.25	446.15	445.55
22.....	444.65	444.9	444.7	444.65	444.35	445.3	445.0	444.9	445.9	446.15	446.15	445.6
23.....	444.6	444.8	444.65	444.6	444.5	445.35	444.85	444.9	445.95	446.35	446.1	445.45
24.....	444.7	444.85	444.65	444.6	444.5	445.3	444.8	444.75	446.0	446.35	446.05	445.3
25.....	444.8	444.8	444.7	444.55	444.65	445.25	444.85	444.8	446.05	446.25	446.05	445.55
26.....	444.75	444.55	444.6	444.55	444.65	445.2	444.75	444.85	446.05	446.2	446.0	445.8
27.....	444.85	444.85	444.65	444.5	444.7	445.4	444.65	445.0	446.15	446.25	446.05	445.7
28.....	444.85	444.8	444.65	444.5	444.7	445.1	444.75	444.8	446.1	446.35	446.05	445.65
29.....	444.85	444.85	444.65	444.45	444.7	445.25	444.9	.....	446.1	446.25	446.1	445.5
30.....	444.85	444.85	444.45	444.55	444.75	445.2	445.0	.....	446.25	446.35	446.1	445.4
31.....	444.8	444.85	.....	444.5	.....	445.35	444.9	.....	446.25	.....	446.1	.....

SENECA RIVER AT WATERLOO

Gage No. 252

Location.— Below lock No. 4 in the village of Waterloo.**Records available.**— June 1, 1915, to June 30, 1916, and June 17, 1917, to June 30, 1921.**Gage.**— Staff at lower end of lower north gate recess of lock No. 4.**Discharge.**— No discharge obtained.**Accuracy.**— Gage read twice daily to tenths.**Coöperation.**— Station established by this Department. Gage read by employees of the Department of Public Works.Daily elevation of water-surface (B. C. DATUM) of SENECA RIVER BELOW LOCK NO. 4,
WATERLOO, for the year ended June 30, 1921

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1	429.35	430.6	431.35	430.9	430.65	430.6	419.95	430.45	430.0	419.35	430.5	430.0
2	429.4	430.9	430.85	431.2	430.95	431.35	419.75	430.65	429.8	419.25	430.7	429.8
3	429.85	430.6	431.3	430.65	431.15	430.45	430.9	430.35	430.0	419.4	430.35	430.1
4	429.4	431.1	430.85	431.1	431.1	430.35	430.5	430.6	430.1	419.35	430.3	430.0
5	429.05	430.75	430.5	431.1	431.3	430.55	430.85	430.55	430.4	419.4	430.6	429.2
6	430.4	430.7	430.8	431.15	431.3	431.15	430.7	430.45	429.35	419.45	430.75	429.75
7	430.15	430.75	431.3	431.3	431.3	431.05	430.85	430.65	430.55	419.45	430.15	430.0
8	430.05	430.2	431.05	431.2	431.1	430.85	430.85	430.65	430.25	425.35	429.8	429.75
9	429.9	430.75	431.15	431.3	430.8	430.9	431.15	430.15	430.1	429.65	430.05	430.0
10	430.0	430.9	431.15	431.0	430.9	430.85	430.85	430.45	429.9	430.0	429.9	429.9
11	430.4	430.95	431.2	430.9	431.1	430.6	430.95	430.35	429.6	429.75	430.0	429.7
12	430.85	430.7	430.3	430.95	430.7	430.6	430.65	430.8	430.35	430.0	430.05	429.85
13	430.9	430.35	430.8	431.15	430.85	430.65	430.8	429.05	429.65	430.6	429.85	429.75
14	430.9	430.3	430.75	431.1	431.1	430.45	430.8	430.6	430.1	430.5	429.75	429.6
15	430.8	430.15	430.65	431.25	431.05	430.95	430.6	430.55	429.85	430.3	430.0	429.8
16	430.85	430.2	430.7	431.2	431.3	430.9	430.35	430.35	430.2	430.15	430.2	430.0
17	430.85	430.2	430.7	430.9	431.2	430.7	430.45	430.55	429.95	430.9	422.9	429.9
18	430.4	430.05	430.8	429.75	431.05	430.1	430.55	430.15	429.35	430.3	429.9	430.0
19	431.1	430.2	430.7	429.1	430.85	430.1	430.85	430.3	426.5	430.9	430.0	429.3
20	430.95	430.45	431.35	430.05	430.6	430.5	431.0	430.2	419.75	431.05	429.75	429.75
21	430.85	430.45	431.1	429.65	430.65	430.45	430.45	430.6	419.35	430.65	429.6	429.5
22	431.0	429.95	430.85	430.0	431.3	430.35	430.95	430.55	419.3	430.7	430.3	429.9
23	430.85	430.25	430.7	431.0	431.1	430.4	430.0	430.55	419.3	430.9	430.2	429.6
24	430.7	429.85	430.85	431.05	431.2	430.8	430.45	430.55	419.3	430.85	429.9	430.05
25	430.35	429.8	430.6	431.1	430.0	430.8	430.8	430.6	419.3	430.0	430.1	429.6
26	430.65	429.85	430.4	431.1	430.75	431.1	430.95	430.9	419.25	431.1	429.95	430.55
27	430.85	430.05	430.6	431.2	431.1	430.85	430.6	430.0	419.25	430.4	430.0	430.15
28	430.8	430.0	430.85	431.2	431.3	430.7	430.55	430.1	419.2	430.6	430.0	429.85
29	430.8	430.3	430.65	430.95	431.33	430.85	430.25	.....	419.25	430.8	430.1	429.9
30	430.8	430.4	430.85	430.85	430.35	430.7	430.4	.....	419.4	430.05	429.5	429.85
31	430.75	431.05	.....	430.6	.....	428.65	430.45	.....	419.3	.....	430.05	.....

SENECA RIVER AT SENECA FALLS

Gage No. 253

Location.— Above lock No. 3 in the village of Seneca Falls.**Records available.**— June 17, 1917, to June 30, 1921.**Gage.**— Staff at the upper end of the north wall of lock No. 3.**Discharge.**— No discharge available.

Accuracy.—Gage read twice daily to tenths.

Coöperation.—Station established by this Department. Gage read by employees of the Department of Public Works.

Daily elevation of water-surface (B. C. Datum) of SENECA RIVER ABOVE LOCK NO. 3
SENECA FALLS, for the year ended June 30, 1921

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1	429.35	430.65	431.5	431.15	430.75	430.65	412.2	430.65	429.8	b	430.7	430.05
2	429.5	430.85	430.95	431.25	431.0	431.25	406.55	430.65	429.75	b	430.75	429.85
3	429.8	430.75	431.3	430.75	431.25	430.45	430.8	430.3	429.9	b	430.8	430.1
4	429.55	431.1	431.05	431.2	431.15	430.3	430.3	430.65	429.95	b	430.3	429.95
5	429.1	430.8	430.65	431.3	431.45	430.75	430.9	430.65	430.4	b	430.7	429.3
6	430.3	430.8	430.9	431.25	431.4	430.5	430.7	430.55	429.55	b	430.55	429.8
7	430.15	430.8	431.4	431.35	431.5	431.05	430.8	430.75	430.5	b	430.25	429.95
8	430.05	430.15	431.05	431.2	431.2	430.95	430.85	430.7	430.3	428.6	429.85	429.65
9	429.85	430.9	431.3	431.4	430.75	431.0	431.25	430.3	430.0	430.3	430.15	429.85
10	430.05	431.0	431.3	431.05	431.05	430.95	430.85	430.45	429.85	429.9	430.0	429.8
11	430.45	431.05	431.25	431.1	431.1	430.75	430.9	430.45	429.7	430.15	430.1	429.75
12	430.95	430.85	430.5	431.0	430.85	430.85	430.75	431.05	430.4	430.2	429.9	430.0
13	430.95	430.45	430.95	431.2	431.0	430.55	430.95	429.2	429.75	430.25	429.6	429.7
14	430.95	430.35	430.9	431.2	431.2	430.6	430.8	430.45	430.0	430.25	429.7	429.6
15	430.85	430.0	430.8	431.35	431.15	430.9	430.6	430.45	429.95	430.2	430.15	429.7
16	430.9	430.2	430.75	431.25	431.4	431.15	430.4	430.35	430.05	430.6	430.1	429.85
17	430.85	430.15	430.8	431.05	431.1	430.75	430.35	430.4	430.2	430.3	429.95	429.9
18	430.4	430.05	430.95	429.85	431.2	430.15	430.55	430.0	429.3	430.75	429.95	430.0
19	431.1	430.2	430.8	429.15	430.9	430.15	430.8	430.2	428.1	430.9	430.0	429.7
20	431.0	430.25	431.4	430.05	430.8	430.55	430.8	430.15	415.85	430.85	429.85	429.75
21	430.95	430.4	431.2	429.65	430.8	430.45	430.55	430.65	b	430.75	429.85	429.4
22	431.05	429.95	430.95	430.0	431.3	430.3	431.0	430.65	b	430.5	430.7	430.0
23	430.95	430.15	430.85	430.95	431.2	430.4	430.1	430.7	b	430.75	430.2	430.05
24	430.85	429.9	430.95	431.2	431.3	430.9	430.5	430.45	b	430.9	429.95	429.75
25	430.45	429.8	430.7	431.2	430.0	430.8	430.9	430.6	b	429.85	430.15	430.05
26	430.75	429.9	430.35	431.2	430.8	430.85	430.95	430.85	b	431.05	429.95	430.6
27	431.0	430.0	430.05	431.2	431.2	430.9	430.65	430.15	b	430.85	430.0	429.8
28	430.95	430.1	430.65	431.25	431.45	430.65	430.65	430.2	b	430.45	429.85	429.95
29	430.75	430.35	430.95	431.05	431.45	430.75	430.25	.....	b	430.6	430.1	429.8
30	430.95	430.65	430.85	431.05	430.35	430.75	430.55	.....	b	430.15	429.55	429.7
31	430.95	431.05	.....	430.65	.....	428.5	430.4	.....	b	.....	429.95	.....

b Pool drawn water surface below gage.

SENECA RIVER, NEAR CAYUGA

Gage No. 401

Location.—Above lock No. 1 about two miles north of the village of Cayuga.

Records available.—June 1, 1919, to June 30, 1921.

Gage.—Staff at the end of upper west gate recess of lock No. 1.

Discharge.—No discharge obtained.

Accuracy.—Gage read twice daily to tenths.

Coöperation.—Station established by this Department. Gage read by employees of the Department of Public Works.

Daily elevation of water-surface (B. C. Datum) of BARGE CANAL ABOVE LOCK No. 1,
C. & S. CANAL, for the year ended June 30, 1921

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	383.00	382.80	382.45	382.55	382.35	383.4	384.1	383.1	382.8	382.85	384.05	383.95
2.....	383.00	382.85	382.45	382.7	382.9	383.75	383.85	383.05	383.0	383.2	384.1	384.1
3.....	383.00	382.80	382.50	382.8	382.45	384.15	383.9	383.0	383.0	382.8	384.2	384.1
4.....	382.90	382.80	382.45	382.7	382.45	384.3	383.95	382.95	383.05	382.85	384.2	383.95
5.....	382.90	382.80	382.55	382.6	382.5	384.35	383.9	382.8	383.2	382.9	384.35	383.95
6.....	382.95	382.75	382.45	382.6	382.4	384.35	383.85	382.9	383.15	382.9	384.3	383.95
7.....	383.10	382.70	382.45	382.65	382.35	384.4	384.15	382.8	383.25	382.95	384.4	383.9
8.....	382.95	382.75	382.40	382.65	382.35	384.4	383.85	382.8	383.4	383.1	384.4	383.85
9.....	382.90	382.60	382.55	382.65	382.65	384.5	383.9	382.9	383.6	383.0	384.4	383.9
10.....	382.95	382.75	382.45	382.6	382.35	384.55	383.9	382.7	383.8	382.8	384.4	383.9
11.....	382.90	382.80	382.40	382.55	382.45	384.4	383.9	382.7	384.0	382.9	384.45	383.95
12.....	382.85	382.70	382.60	382.55	382.25	384.4	383.8	382.7	384.0	383.05	384.4	383.8
13.....	382.90	382.80	382.40	382.6	382.25	384.45	383.85	382.7	384.15	383.05	384.45	383.85
14.....	382.90	382.70	382.40	382.6	382.4	384.45	384.05	382.7	384.25	383.15	384.25	383.8
15.....	382.90	382.70	382.50	382.6	382.25	384.5	383.8	382.7	384.3	383.15	384.25	383.85
16.....	382.80	382.75	382.55	382.6	382.2	384.35	383.95	382.7	384.25	383.1	384.15	383.9
17.....	382.85	382.80	382.40	382.6	382.35	384.3	383.45	382.9	384.45	383.1	384.2	383.9
18.....	382.90	382.70	382.45	382.65	382.35	384.2	383.55	382.85	384.15	383.15	384.15	383.9
19.....	382.90	382.70	382.35	382.6	382.45	384.15	383.55	382.95	384.7	383.2	384.15	383.85
20.....	382.90	382.85	382.40	382.65	382.4	384.1	383.6	382.9	384.35	383.3	384.2	383.9
21.....	382.90	383.00	382.40	382.6	382.4	384.05	383.45	382.9	384.05	383.35	384.1	383.9
22.....	382.80	382.70	382.40	382.5	382.55	384.3	383.45	382.95	383.85	383.35	384.15	384.0
23.....	382.90	382.65	382.35	382.5	382.65	384.1	383.45	382.9	383.95	383.5	384.0	383.95
24.....	382.95	382.70	382.40	382.6	382.9	384.05	383.3	382.8	384.15	383.65	384.25	383.9
25.....	382.80	382.65	382.30	382.5	383.0	384.0	383.25	382.8	383.65	383.75	384.15	383.9
26.....	382.90	382.65	382.30	382.55	383.1	383.95	383.3	382.7	383.6	383.9	384.05	383.9
27.....	382.90	382.70	382.35	382.8	383.25	383.95	383.25	382.65	383.5	384.2	384.1	383.9
28.....	382.90	382.60	382.35	382.45	383.3	383.9	383.25	382.75	383.15	383.95	384.1	383.95
29.....	382.90	382.65	382.40	382.45	383.3	383.95	383.2	.....	383.15	384.1	384.05	383.95
30.....	382.90	382.70	382.30	382.5	383.4	383.95	383.1	.....	383.5	384.1	384.0	383.9
31.....	382.80	382.60	.....	382.45	.....	383.9	383.1	.....	383.35	.....	383.95	.....

SENECA RIVER, NEAR CAYUGA

Gage No. 402

Location.— Below lock No. 1 about two miles north of the village of Cayuga.

Records available.— June 1, 1919, to June 30, 1921. At Free Bridge, about one mile down stream, January 1, 1915, to June 2, 1919.

Gage.— Staff on the west wall just north of the lower gates of lock No. 1.

Discharge.— No discharge obtained.

Accuracy.— Gage read twice daily to tenths.

Coöperation.— Station established by this Department. Gage read by employees of the Department of Public Works.

Daily elevation of water-surface (B. C. Datum) of BARGE CANAL BELOW LOCK No. 1,
C. & S. CANAL, for the year ended June 30, 1921

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	374.40	374.60	373.15	374.75	374.4	375.85	376.05	376.0	376.8	378.5	375.7	375.35
2.....	374.25	374.50	373.10	374.8	374.25	377.3	376.35	375.9	376.8	378.5	375.7	375.25
3.....	374.20	374.65	373.05	374.95	374.3	378.6	376.8	375.8	377.25	378.0	375.8	375.1
4.....	374.15	374.60	373.10	374.9	374.4	378.45	376.9	375.8	377.45	376.6	375.7	375.2
5.....	374.20	374.40	373.20	374.75	374.2	377.9	376.85	375.8	377.15	375.9	375.65	375.2
6.....	374.25	374.25	373.40	374.65	374.2	377.45	376.7	375.95	377.15	375.45	375.7	373.2
7.....	374.10	374.15	373.65	374.55	374.25	377.2	376.5	376.15	378.2	375.15	375.5	375.2
8.....	374.05	374.10	373.70	374.45	374.25	377.0	376.35	376.2	378.95	375.05	375.5	375.05
9.....	374.05	374.20	374.00	374.4	374.1	376.7	376.2	376.1	379.4	375.2	375.6	374.85
10.....	374.30	374.20	374.35	374.55	374.25	376.8	376.15	376.2	379.7	375.45	375.6	374.75
11.....	374.45	374.20	374.45	374.6	374.3	377.1	376.05	376.35	379.35	375.45	375.5	374.6
12.....	374.70	374.15	374.80	374.4	374.25	377.2	375.9	376.1	378.9	375.25	375.75	374.7
13.....	374.70	374.15	374.95	374.35	374.15	377.3	375.85	376.0	378.7	375.5	375.8	374.65
14.....	374.70	374.10	374.95	374.25	374.15	377.4	375.65	376.05	378.8	375.5	375.85	374.75
15.....	374.70	374.30	374.10	374.2	374.2	377.6	375.65	376.0	378.8	375.25	375.9	374.6
16.....	374.70	374.25	374.65	374.35	374.2	377.6	375.6	376.0	378.85	375.3	375.8	374.5
17.....	374.60	374.30	374.50	374.4	374.45	377.55	375.85	378.15	378.8	375.3	375.85	374.4
18.....	374.65	374.15	374.40	374.6	374.65	377.35	376.4	378.95	378.8	375.45	375.75	374.4
19.....	375.20	374.05	374.40	374.6	375.0	377.3	376.25	378.35	378.65	375.65	375.8	374.45
20.....	375.15	373.90	374.50	374.25	375.2	376.95	376.3	377.7	379.15	375.6	375.7	374.45
21.....	375.00	373.65	374.35	374.05	375.4	376.55	376.3	377.1	379.6	375.35	375.65	374.35
22.....	374.80	373.85	374.40	373.9	375.65	376.3	376.3	376.55	379.45	375.45	375.45	374.4
23.....	374.70	373.95	374.45	374.0	376.05	376.2	376.35	376.25	379.05	375.8	375.55	374.35
24.....	374.85	373.80	374.35	374.2	377.3	376.35	376.3	376.2	378.8	376.8	375.25	374.35
25.....	374.85	373.60	374.35	374.3	377.45	376.3	376.7	376.1	378.65	377.5	375.15	374.4
26.....	374.85	373.60	374.40	374.4	376.9	376.3	376.35	376.05	378.4	376.65	375.3	374.4
27.....	374.75	373.30	374.40	374.35	376.55	376.35	376.2	376.0	378.3	376.1	375.15	374.35
28.....	374.65	373.25	374.40	374.4	376.35	376.3	376.15	376.25	378.3	375.95	375.05	374.3
29.....	374.60	373.25	374.40	374.35	376.15	376.25	376.0	.....	378.4	375.65	375.1	374.45
30.....	374.45	373.35	374.50	374.3	375.85	376.3	376.05	.....	378.4	375.65	375.2	374.4
31.....	374.45	373.25	.....	374.3	.....	376.15	376.1	.....	378.4	.....	375.15	.....

SENECA RIVER AT BALDWINSVILLE

Gage No. 199

Location.—Above the dam in the village of Baldwinsville.

Records available.—Discharge, November 12, 1898, to December 31, 1908. Water surface elevations, April 1, 1904, to June 30, 1921.

Gage.—Staff on the west end of the north retaining wall above lock No. 24.

Discharge.—No discharge obtained.

Accuracy.—Gage read twice daily to half-tenths.

Coöperation.—Station established by the United States Deep Waterways Survey, now maintained by this Department. Gage read by employees of the Department of Public Works.

**Daily elevation of water-surface (B. C. Datum) of SENECA RIVER ABOVE DAM AT
BALDWINVILLE, for the year ended June 30, 1921**

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.	373.85	374.18	372.55	374.10	373.80	374.92	375.17	374.62	375.30	376.15	374.97	374.48
2.	373.62	374.15	372.45	374.25	373.80	375.50	375.40	374.60	375.40	376.20	374.95	374.50
3.	373.55	374.00	372.50	374.52	373.87	376.18	375.30	374.63	375.57	376.25	374.95	374.52
4.	373.72	373.98	372.62	374.38	373.83	376.22	375.50	374.62	375.70	375.60	374.90	374.50
5.	373.78	373.85	372.78	374.17	373.77	376.30	375.50	374.73	375.73	375.10	374.83	374.52
6.	373.70	373.75	372.90	374.13	373.75	376.00	375.48	374.95	375.75	374.52	374.70	374.53
7.	373.65	373.70	373.12	374.05	373.75	375.83	375.40	375.03	375.92	374.75	374.72	374.40
8.	373.68	373.70	373.30	373.97	373.75	375.65	375.22	374.87	376.35	374.58	374.70	374.30
9.	373.62	373.72	373.58	374.00	373.70	375.45	375.20	374.93	376.63	374.70	374.80	374.25
10.	373.70	373.62	373.92	374.15	373.82	375.40	375.03	374.90	376.90	374.75	374.75	374.17
11.	373.98	373.58	374.05	374.05	373.88	375.45	374.95	374.90	376.65	374.70	374.65	374.15
12.	374.18	373.90	374.35	373.87	373.95	375.72	374.87	374.90	376.62	374.70	374.80	374.20
13.	374.18	373.65	374.52	373.78	373.90	375.68	374.68	375.00	376.55	374.70	374.90	374.15
14.	374.20	373.58	374.48	373.72	373.72	375.70	374.70	374.85	376.30	374.85	374.90	374.05
15.	374.20	373.70	374.32	373.70	373.70	375.87	374.72	374.72	376.32	374.75	374.95	374.07
16.	374.20	373.72	374.28	373.80	373.73	375.88	374.75	374.80	376.30	374.65	374.87	373.93
17.	374.20	373.62	374.15	374.03	373.97	375.82	374.70	375.60	376.30	374.75	374.78	373.85
18.	374.25	373.60	374.05	374.07	374.15	375.83	374.50	376.13	376.40	374.70	374.65	374.00
19.	374.50	373.40	374.05	373.83	374.28	375.77	374.78	376.20	376.40	374.72	374.65	373.95
20.	374.55	373.22	373.98	373.65	374.55	375.63	374.85	375.95	376.55	374.65	374.75	373.93
21.	374.40	373.12	373.90	373.52	374.67	375.42	374.90	375.50	376.65	374.55	374.80	373.85
22.	374.28	373.12	374.02	373.43	374.63	375.25	375.05	375.20	376.60	374.68	374.80	374.02
23.	374.15	373.38	374.05	373.62	374.95	375.35	375.20	375.10	376.50	374.90	374.70	373.80
24.	374.40	373.15	373.98	373.75	375.55	375.30	374.95	374.95	376.35	375.37	374.53	373.85
25.	374.48	373.05	373.95	373.87	375.95	375.35	374.67	374.83	376.20	375.63	374.62	373.90
26.	374.40	372.92	374.05	373.88	375.75	375.22	374.68	374.95	376.05	375.52	374.50	373.87
27.	374.28	372.75	373.95	373.92	375.50	375.13	374.70	375.10	376.20	375.20	374.63	373.85
28.	374.15	372.68	373.95	373.90	375.57	375.15	374.65	375.10	376.10	375.10	374.42	373.78
29.	374.05	372.82	373.92	373.85	375.18	375.10	374.70	.....	376.05	374.95	374.60	373.85
30.	373.92	372.85	373.88	373.85	375.05	375.10	374.82	.....	376.00	374.90	374.57	373.77
31.	373.90	372.70	.....	373.95	.....	375.15	374.78	.....	376.10	.....	374.45	.....

SENECA RIVER AT BALDWINVILLE

Gage No. 198

Location.—Below dam in the village of Baldwinsville.

Records available.—April 1, 1904, to June 30, 1921.

Gage.—Staff in two sections on lower north approach wall of lock No. 24.

Discharge.—No discharge obtained.

Accuracy.—Gage read twice daily to half-tenths.

Coöperation.—Station established by the United States Deep Waterways Survey, now maintained by this Department. Gage read by employees of the Department of Public Works.

Daily elevation of water-surface (B. C. Datum) of SENECA RIVER BELOW DAM AT
BALDWINVILLE, for the year ended June 30, 1921

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.	363.45	363.52	363.02	363.45	363.75	364.77	364.32	364.68	364.95	365.85	364.20	364.07
2.	363.40	363.78	362.88	363.70	363.75	365.25	364.40	364.57	365.02	365.90	364.43	364.13
3.	363.40	363.82	362.52	363.70	363.62	365.90	364.78	364.53	365.23	365.70	364.53	364.00
4.	363.30	363.85	362.40	363.97	363.55	366.05	364.97	364.42	365.35	365.35	364.60	363.95
5.	363.50	363.80	362.60	363.88	363.58	365.95	365.00	364.30	365.30	364.95	364.60	363.90
6.	363.68	363.85	363.05	363.77	363.57	365.75	365.03	364.38	365.32	364.60	364.45	364.00
7.	363.58	363.80	363.28	363.75	363.65	365.42	364.92	364.50	365.78	364.75	364.37	363.92
8.	363.48	363.78	362.95	363.73	363.80	365.00	364.83	364.55	366.25	364.45	364.35	363.83
9.	363.40	363.85	362.50	363.60	363.65	364.88	364.70	364.55	366.55	364.50	364.40	363.80
10.	363.25	363.90	362.45	363.47	363.37	364.77	364.58	364.57	366.80	364.40	364.20	363.60
11.	363.25	363.80	362.60	363.73	363.33	364.65	364.42	364.80	366.90	364.40	364.30	363.62
12.	363.58	363.78	363.15	363.65	363.35	364.70	364.28	364.68	366.70	364.40	364.35	363.53
13.	363.45	363.78	363.68	363.52	363.55	364.85	364.30	364.50	366.75	364.40	364.50	363.80
14.	363.32	363.65	363.68	363.50	363.70	364.97	364.25	364.55	366.37	364.60	364.35	363.67
15.	363.35	363.60	363.55	363.50	363.75	365.25	364.17	364.45	366.23	364.50	364.43	363.65
16.	363.32	363.62	363.55	363.45	363.75	365.38	364.10	364.40	366.25	364.22	364.37	363.60
17.	363.08	363.58	363.38	363.40	363.92	365.40	364.15	365.27	366.50	364.28	364.30	363.60
18.	363.12	363.65	363.28	363.65	364.10	365.30	364.55	366.00	366.57	364.52	364.28	363.53
19.	363.72	363.52	363.20	363.80	364.20	364.95	364.70	365.95	366.40	364.63	364.30	363.50
20.	363.78	363.52	363.45	363.80	363.80	364.80	364.70	365.68	366.40	364.55	364.20	363.62
21.	363.75	363.50	363.40	363.85	364.45	364.65	364.70	365.25	366.68	364.35	364.20	363.60
22.	363.70	363.50	363.15	363.73	364.70	364.47	364.78	364.90	366.65	364.20	364.25	363.30
23.	363.62	363.55	363.12	363.50	364.87	364.48	364.78	364.65	366.55	364.57	364.32	363.30
24.	363.55	363.40	363.10	363.52	365.38	364.55	364.77	364.47	366.40	364.15	364.32	363.30
25.	363.62	363.35	363.12	363.60	365.52	364.47	364.83	364.55	366.20	365.60	364.15	363.25
26.	363.60	363.30	363.18	363.55	365.48	364.32	364.82	364.40	366.05	365.62	364.07	363.35
27.	363.62	363.25	363.55	363.63	365.23	364.28	364.68	364.30	365.90	365.08	364.10	363.42
28.	363.50	363.12	363.40	363.57	365.05	364.60	364.60	364.65	365.90	364.67	364.03	363.43
29.	363.45	362.98	363.25	363.60	365.30	364.90	364.57	.....	365.90	364.48	363.97	363.42
30.	363.38	363.25	363.28	363.58	364.95	364.65	364.50	.....	365.90	364.35	364.10	363.45
31.	363.30	363.12	.....	363.55	.....	364.47	364.50	.....	365.80	.....	364.08	.....

SENECA LAKE DESCRIPTION

Seneca lake, the largest and deepest of the finger group lakes of central New York, has a length of about 34.4 miles and a width varying from 1 to 3 miles. The area draining directly into Seneca lake, exclusive of Keuka lake above its outlet, is 529 square miles, of which 67 square miles, or 12.7 per cent, is water-surface. The total drainage above the outlet at Geneva is 708 square miles, of which 85 square miles, or 12 per cent, is water-surface.

The discharge from and the surface of this lake is controlled by regulating works at Waterloo, about 5 miles from the lake, constructed in connection with the canalization of the Seneca river for the Barge canal. The new dam, or regulating works, consisting of six Taintor gates, each having a clear span of 36 feet, three with sills at elevation 439.0 and three at elevation 435.0, is located immediately below and replaces the old fixed dam. The three larger openings can pass water only to the

power-plant of the Tracy Development Company. The low navigable surface above this dam is elevation 445.0.

SENECA LAKE AT WATKINS

Gage No. 209

Location.—Near Lembeck and Betz's malt house in the village of Watkins.

Records available.—September 21, 1912, to June 30, 1921.

Gage.—Staff at docking end of boat slip back of Lembeck and Betz's malt house. Read by Mr. Fred Wright.

Accuracy.—Gage read once daily to even hundredths.

Coöperation.—Station established and maintained by this Department.

Daily elevation of water-surface (B. C. Datum) of SENECA LAKE AT WATKINS, for the year ended June 30, 1921

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.	444.90	444.88	444.88	444.90	444.64	445.0	445.32	444.92	445.10	446.20	446.50	446.10
2.	444.90	444.88	444.86	444.90	444.62	445.20	445.32	444.90	445.20	446.20	446.50	446.8
3.	444.90	444.88	444.84	444.90	444.60	445.3	445.32	444.88	445.20	446.30	446.50	446.8
4.	444.90	444.88	444.82	444.88	444.60	445.3	445.32	444.86	445.20	446.30	446.50	446.6
5.	444.90	444.88	444.80	444.86	444.60	445.30	445.32	444.84	445.20	446.30	446.50	446.6
6.	444.90	444.88	444.80	444.84	444.60	445.34	445.32	444.82	445.40	446.40	446.48	446.4
7.	444.90	444.88	444.80	444.84	444.60	445.40	445.30	444.80	445.40	446.40	446.46	446.2
8.	444.90	444.88	444.80	444.84	444.58	445.44	445.30	444.78	445.50	446.40	446.44	446.2
9.	444.90	444.88	444.80	444.82	444.56	445.50	445.30	444.76	445.50	446.40	446.42	446.2
10.	444.90	444.88	444.80	444.80	444.54	445.50	445.30	444.74	445.60	446.40	446.40	446.
11.	444.90	444.88	444.82	444.80	444.52	445.50	445.30	444.72	445.70	446.38	446.40	446.
12.	444.90	444.94	444.84	444.80	444.50	445.50	445.30	444.70	445.80	446.36	446.40	446.
13.	444.70	444.94	444.86	444.80	444.50	445.50	445.30	444.70	445.90	446.34	446.40	446.
14.	444.70	445.00	444.84	444.80	444.50	445.50	445.30	444.70	445.90	446.32	446.38	445.98
15.	444.70	445.00	444.82	444.80	444.48	445.50	445.28	444.70	446.	446.30	446.38	445.96
16.	444.70	445.00	444.80	444.80	444.60	445.50	445.26	444.70	446.	446.28	446.36	445.94
17.	444.70	445.00	444.80	444.80	444.60	445.48	445.22	445.	446.	446.28	446.34	445.92
18.	444.70	445.00	444.80	444.80	444.60	445.46	445.20	445.	446.	446.28	446.32	445.90
19.	444.70	445.00	444.80	444.78	444.60	445.44	445.18	445.	446.	446.30	446.30	445.88
20.	444.70	445.00	444.80	444.78	444.60	445.42	445.16	445.	446.	446.30	446.28	445.86
21.	444.70	445.00	444.80	444.78	444.60	445.42	445.14	445.	446.	446.30	446.26	445.84
22.	444.70	445.00	444.80	444.78	444.60	445.42	445.12	445.	446.	446.30	446.24	445.82
23.	444.70	445.00	444.78	444.78	444.70	445.42	445.10	445.	446.	446.30	446.22	445.80
24.	444.70	445.00	444.76	444.76	444.70	445.42	445.8	445.	446.	446.40	446.20	445.78
25.	444.90	445.00	444.74	444.74	444.80	445.42	445.6	445.	446.	446.40	446.18	445.76
26.	444.90	445.00	444.72	444.72	444.80	445.40	445.4	445.	446.	446.50	446.16	445.74
27.	444.90	444.98	444.70	444.70	444.90	445.38	445.2	445.	446.	446.50	446.14	445.72
28.	444.90	444.96	444.70	444.70	444.90	445.38	445.	445.10	446.	446.50	446.12	445.72
29.	444.90	444.94	444.70	444.70	445.0	445.38	444.98	.....	446.	446.50	446.12	445.70
30.	444.90	444.92	444.70	444.68	445.0	445.36	444.96	.....	446.10	446.50	446.12	445.70
31.	444.88	444.90	.....	444.66	.....	445.34	444.94	.....	446.10	.....	446.10	.....

SENECA LAKE AT GENEVA

Gage No. 208

Location.—At the Lake Street bridge over the Seneca and Cayuga canal in the city of Geneva.

Records available.—January 1, 1915, to June 30, 1921.

Gage.—Staff on east harbor wall just above the Lake Street bridge. Read by Mr. T. C. McNicholas.

Accuracy.—Gage read once daily to half-tenths and even hundredths.

Coöperation.—Station established and maintained by this Department.

Daily elevation of water-surface (B. C. Datum) of **SENECA LAKE AT GENEVA**, for the year ended June 30, 1921

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.	444.72	444.80	a	444.85	a	444.88	445.28	444.90	445.12	446.28	446.50	446.10
2.	444.74	444.82	a	444.90	a	445.18	445.30	445.0	445.25	446.28	446.50	446.12
3.	444.65	444.90	444.80	444.84	a	445.30	445.28	444.90	445.15	446.30	446.52	446.10
4.	444.68	444.90	444.80	444.84	a	445.25	445.28	444.92	445.18	446.32	446.52	446.10
5.	444.70	444.95	444.80	444.80	a	445.34	445.30	444.82	445.28	446.38	446.44	446.10
6.	444.74	444.95	444.80	444.80	444.50	445.38	445.25	444.80	445.28	446.40	446.46	446.08
7.	444.72	444.98	444.76	444.86	444.60	445.38	445.46	444.80	445.28	446.38	446.42	446.04
8.	444.74	444.85	444.78	444.88	444.60	445.28	445.28	444.80	445.42	446.38	446.45	446.10
9.	444.72	444.80	444.75	444.84	444.58	445.40	445.28	444.90	445.42	446.35	446.32	446.02
10.	444.76	444.92	444.76	444.80	444.56	445.48	445.28	445.00	445.48	446.28	446.40	446.00
11.	444.76	445.00	444.85	444.80	444.58	445.40	445.28	444.82	445.58	446.28	446.42	446.00
12.	444.78	444.98	444.84	444.76	444.52	445.36	445.22	444.78	445.80	446.28	446.28	446.02
13.	444.78	444.94	444.82	444.78	444.50	445.48	445.24	444.80	445.65	446.28	446.40	446.00
14.	444.72	444.98	444.78	444.78	444.40	445.66	445.34	444.82	445.70	446.26	446.30	445.98
15.	444.70	445.00	444.80	444.78	444.40	445.40	445.30	445.0	445.78	446.24	446.32	446.0
16.	444.75	445.02	444.74	444.78	444.35	445.50	445.40	444.88	445.90	446.20	446.30	445.96
17.	444.70	445.04	444.76	444.80	444.50	445.42	445.0	445.00	445.90	446.22	446.30	445.96
18.	444.70	445.06	444.78	444.85	444.46	445.40	445.0	445.00	445.88	446.22	446.32	445.92
19.	444.75	445.02	444.74	444.82	444.56	445.40	445.0	445.10	446.10	446.30	446.30	445.82
20.	444.78	445.08	444.70	444.82	444.56	445.38	445.02	445.08	446.00	446.32	446.20	445.84
21.	444.78	445.08	444.76	444.78	444.64	445.32	445.0	445.08	446.02	446.20	446.18	445.82
22.	444.80	445.04	444.72	444.74	444.68	445.60	444.90	445.04	446.00	446.16	446.20	445.80
23.	444.78	445.00	444.72	444.74	444.72	445.42	444.92	445.0	446.00	446.34	446.22	445.80
24.	444.82	444.98	444.70	444.76	444.76	445.30	444.92	445.04	446.30	446.38	446.30	445.80
25.	a	444.98	444.72	444.70	444.78	445.42	444.94	445.06	446.02	446.40	446.22	445.78
26.	a	444.98	444.72	444.66	444.80	445.48	444.94	445.06	446.08	446.40	446.22	445.76
27.	444.89	444.96	444.74	a	444.80	445.45	445.0	445.06	a	446.50	446.20	445.78
28.	444.90	444.95	444.65	a	444.82	445.30	445.0	445.10	a	446.50	446.12	445.76
29.	444.94	a	444.70	a	444.86	445.25	444.90	.....	a	446.42	446.10	445.75
30.	444.96	a	444.90	a	445.00	445.30	444.92	.....	446.15	446.42	446.10	445.74
31.	444.80	a	.....	a	.....	445.24	444.90	.....	446.25	.....	446.08	.....

a No reading.

CAYUGA LAKE DESCRIPTION

Cayuga lake, the second in size of the finger lakes, has a length of about $37\frac{1}{2}$ miles and a width varying from 1 to 3 miles, and lies generally in a north and south direction.

Records of water-surface fluctuations in this lake in addition to those previously published in various reports of the Department of State Engineer are those of Professor C. L. Crandall of Cornell University, Ithaca, which consist of observations at varying intervals, beginning January, 1879.

CAYUGA LAKE, NEAR ITHACA

Gage No. 207

Location.—At Willow Point about two miles north of the city of Ithaca on the east shore.

Records available.—August 6, 1905, to June 30, 1921.

Gage.—Staff on the south side of Lane's dock at Willow Point. Read by Mr. William H. Lane.

Accuracy.—Gage read once daily to half-tenths.

Coöperation.—Station established by the United States Geological Survey. Maintained by this Department since 1909.

Daily elevation of water-surface (B. C. Datum) of CAYUGA LAKE AT WILLOW POINT, NEAR ITHACA, for the year ended June 30, 1921

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	383.2	382.95	382.65	382.7	382.55	383.9	384.0	383.25	382.9	383.1	384.3	384.15
2.....	383.2	382.95	382.65	382.7	382.5	384.0	384.0	383.2	382.95	383.1	384.3	384.15
3.....	383.2	382.95	382.6	382.75	382.5	384.2	384.0	383.15	383.1	383.0	384.4	384.1
4.....	383.2	382.9	382.6	382.8	382.5	384.4	384.0	383.1	383.15	382.95	384.4	384.1
5.....	383.15	382.9	382.6	382.8	382.5	384.5	383.95	383.0	383.2	382.95	384.5	384.1
6.....	383.15	382.85	382.55	382.8	382.5	384.5	383.95	383.0	383.2	382.95	384.55	384.1
7.....	383.1	382.85	382.55	382.75	382.45	384.6	383.95	383.0	383.4	382.95	384.55	384.1
8.....	383.1	382.85	382.55	382.75	382.45	384.65	384.0	382.95	383.6	382.95	384.55	384.1
9.....	383.05	382.85	382.5	382.75	382.45	384.6	384.05	382.95	383.7	382.95	384.6	384.05
10.....	383.0	382.85	382.5	382.7	382.4	384.55	384.0	382.9	383.8	383.0	384.6	384.05
11.....	383.0	382.9	382.5	382.7	382.4	384.5	383.95	382.9	383.9	383.0	384.6	384.05
12.....	383.0	382.9	382.5	382.7	382.4	384.5	383.95	382.9	384.0	383.1	384.6	384.1
13.....	383.0	382.9	382.5	382.7	382.4	384.5	383.9	382.8	384.2	383.1	384.6	384.15
14.....	383.0	382.9	382.5	382.7	382.4	384.6	383.9	382.7	384.4	383.2	384.6	384.1
15.....	382.95	382.95	382.5	382.7	382.4	384.65	383.9	382.6	384.4	383.2	384.55	384.1
16.....	382.95	382.95	382.5	382.7	382.4	384.6	383.85	382.6	384.45	383.3	384.5	384.1
17.....	382.95	382.95	382.5	382.65	382.45	384.5	383.8	382.9	384.4	383.35	384.45	384.1
18.....	382.95	382.9	382.5	382.65	382.5	384.4	383.8	383.0	384.35	383.4	384.4	384.1
19.....	382.9	382.9	382.45	382.65	382.55	384.3	383.75	383.1	384.3	383.45	384.4	384.1
20.....	382.9	382.9	382.45	382.65	382.55	384.3	383.7	383.1	384.3	383.5	384.35	384.1
21.....	382.9	382.9	382.45	382.6	382.6	384.2	383.7	383.0	384.2	383.5	384.3	384.1
22.....	382.9	382.85	382.45	382.6	382.7	384.25	383.68	383.0	384.1	383.55	384.3	384.1
23.....	382.95	382.85	382.45	382.6	382.8	384.25	383.6	382.95	384.0	383.55	384.3	384.1
24.....	383.0	382.8	382.45	382.6	382.9	384.2	383.6	382.9	383.9	383.95	384.3	384.1
25.....	383.1	382.8	382.45	382.6	383.0	384.2	383.5	382.85	383.8	384.0	384.3	384.1
26.....	383.05	382.8	382.4	382.6	383.2	384.15	383.45	382.8	383.7	384.0	384.3	384.1
27.....	383.05	382.75	382.4	382.6	383.3	384.1	383.45	382.85	383.6	384.1	384.25	384.1
28.....	383.0	382.75	382.5	382.6	383.4	384.1	383.4	382.9	383.5	384.2	384.25	384.1
29.....	383.0	382.75	382.55	382.65	383.5	384.05	383.4	.....	383.4	384.2	384.25	384.1
30.....	383.0	382.7	382.65	382.55	383.7	384.0	383.35	.....	383.3	384.3	384.2	384.1
31.....	383.0	382.7	.....	382.55	.....	384.0	383.3	.....	383.2	.....	384.25	.....

OWASCO OUTLET

DESCRIPTION

Owasco lake is one of the finger lake group in central New York and is generally rated as the sixth in size. It is about 11 miles long and has a maximum width of 1.25 miles. It has a water-surface area of approximately 10.4 square miles and is drained by Owasco outlet.

OWASCO LAKE OUTLET, NEAR AUBURN

Location.—On the farm of Charles H. Pearce, 2 miles below center of Auburn, Cayuga county, and $3\frac{3}{4}$ miles below State dam at outlet of Owasco lake.

Drainage area.—206 square miles (measured on topographic maps).

Records available.—November 17, 1912, to June 30, 1921.

Gage.—Gurley water-stage recorder in a concrete shelter on left bank. Recorder inspected by Charles H. Pearce.

Discharge measurements.—Made from a cable directly opposite the gage, or by wading 100 feet below the dam.

Channel and control.—A low concrete control has been constructed about 15 feet below the gage. Crest of control is 1 foot wide and the slopes of both upstream and downstream faces are $\frac{1}{2}:1$. A small horizontal apron built on a level with the bed of the stream extends down stream $21\frac{1}{2}$ feet from toe of dam. Mean elevation of the left end of the dam for a distance of 50 feet is gage height 1.28 feet; the remaining 50 feet of the crest of the dam is at a gage height 2.13 feet.

Extremes of discharge.—Maximum stage during year from water-stage recorder, 3.44 feet at 1:30 p. m. March 16 (discharge, 1,040 second-feet); minimum discharge, 3.8 second-feet at 7 p. m. August 21, corresponding to gage-height of 1.38 feet.

1912-1921: Maximum stage, 6.4 feet during period March 25-30, 1913, determined by leveling from flood marks (discharge, 2,750 second-feet); minimum stage from water-stage recorder, that of current year.

Ice.—Stage-discharge relation seldom affected by ice.

Diversions.—An average flow of about 10 second-feet is pumped from Owasco lake for the municipal water supply at the city of Auburn. Proportion returning to stream above the gaging station is not known.

Regulation.—Large diurnal fluctuation in flow during low-water periods due to operation of mills in the city of Auburn; seasonal flow regulated at the State dam.

Accuracy.—Stage-discharge relation permanent except as affected by aquatic growth in July; not affected by ice during year. Rating curve well defined between 1 and 1,700 second-feet. Operation of the water-stage recorder satisfactory throughout year. Daily discharges ascertained by averaging the hourly discharge. Records excellent.

Coöperation.—Station maintained by the United States Geological Survey in coöperation with the State Engineer and Surveyor.

Discharge measurements of OWASCO LAKE OUTLET NEAR AUBURN, during the year
ending June 30, 1921

DATE	Made by	Gage height	Discharge
		Feet	Sec. ft.
July 9	Otto Lauterhahn	2.38	225
July 9	Otto Lauterhahn	2.21	150
Aug. 3	Otto Lauterhahn	2.24	140
Aug. 3	Otto Lauterhahn	2.28	174
Aug. 26	Otto Lauterhahn	1.68	31.7
Sept. 5	Otto Lauterhahn	1.57	19.0
Sept. 5	Otto Lauterhahn	1.57	18.8
Sept. 25	Lauterhahn and Lamoureux	2.07	112
Oct. 13	Lauterhahn and Covert	2.36	198
Oct. 14	Otto Lauterhahn	2.35	210
Oct. 14	Otto Lauterhahn	2.34	211
Dec. 4	Otto Lauterhahn	2.83	529
Dec. 28	Otto Lauterhahn	2.67	390
Dec. 28	Otto Lauterhahn	2.67	381
Feb. 3	Otto Lauterhahn	2.46	277
May 24	Howe and Lauterhahn	2.41	254

Daily discharge, in second-feet, of OWASCO LAKE OUTLET NEAR AUBURN, for the year
ending June 30, 1921

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1	168	28	87	106	128	199	286	250	281	454	380	193
2	164	88	74	70	136	324	292	242	335	451	392	169
3	160	85	71	26	122	457	299	253	335	416	386	192
4	131	77	49	97	124	476	295	224	205	364	362	162
5	144	76	20	127	125	549	296	187	208	352	368	146
6	160	79	25	164	130	564	310	222	278	329	363	171
7	175	49	102	163	124	566	299	220	509	342	346	171
8	166	15	78	159	126	559	292	211	556	343	332	171
9	157	93	70	158	136	550	285	192	686	333	309	176
10	131	79	78	146	66	510	293	200	794	325	271	178
11	131	84	72	169	52	454	276	209	805	299	262	168
12	147	82	53	152	97	444	282	181	789	224	239	168
13	138	82	119	153	55	448	286	199	785	228	234	175
14	157	52	81	144	30	453	288	213	810	225	227	175
15	141	20	72	150	53	440	274	205	780	229	221	169
16	144	96	84	144	46	450	244	208	738	228	222	176
17	141	85	82	96	116	431	271	221	787	232	211	175
18	144	78	78	125	116	429	283	216	765	240	223	150
19	166	80	29	131	142	398	280	211	772	229	240	105
20	158	86	79	122	124	408	260	209	744	220	218	136
21	144	59	82	128	33	382	259	212	676	228	218	142
22	96	25	85	117	147	381	254	204	603	222	214	157
23	92	98	84	91	185	381	246	201	573	222	207	145
24	80	86	52	25	159	374	265	206	589	240	180	138
25	32	84	55	131	149	359	266	224	536	276	167	141
26	124	81	28	125	148	363	262	228	472	271	180	142
27	82	80	81	104	151	374	269	250	470	416	181	145
28	93	71	92	120	143	354	250	279	482	415	163	139
29	83	42	79	117	157	352	251	.....	459	391	149	137
30	82	124	106	106	152	326	242	.....	443	381	141	135
31	68	84	.....	109	.....	292	260	.....	463	.....	181	.....

Monthly discharge of OWASCO LAKE OUTLET NEAR AUBURN, for the year ending
June 30, 1922
[Drainage area 206 square miles]

MONTH	DISCHARGE IN SECOND-FEET				RUN-OFF
	Maximum	Minimum	Mean	Per square mile	Depth in inches on drainage area
July.....	175	32	129	.626	.72
August.....	124	15	72.5	.352	.41
September.....	119	20	72.6	.352	.39
October.....	169	25	122	.592	.68
November.....	185	30	116	.563	.63
December.....	566	199	421	2.04	2.35
January.....	310	242	275	1.33	1.53
February.....	279	181	217	1.05	1.09
March.....	810	205	572	2.78	3.20
April.....	454	220	304	1.48	1.65
May.....	392	141	251	1.22	1.41
June.....	193	105	158	.767	.86
The year.....	810	15	227	1.10	14.92

ONONDAGA LAKE . DESCRIPTION

Onondaga lake, situated north of the city of Syracuse, is about $4\frac{1}{2}$ miles long, having an average width of 1 mile and a surface area of 4.7 square miles. The surface elevation is about 365, Barge canal datum, and has an average annual range of nearly 6 feet.

The drainage area, including the lake surface, is about 288 square miles, lying mostly to the south and southwest. Included in this area is Otisco lake with a water-surface of 3.3 square miles, discharging through Nine-Mile creek, and a group of small lakes drained by Onondaga creek. Besides these principal tributaries there are a few small streams entering the lake from the north and east.

Onondaga lake discharges into the Seneca river through Onondaga outlet, which is canalized as a part of the Barge canal system. A low navigable stage at elevation 363.0 is maintained on this lake by the dam on the Oswego river at Phoenix.

ONONDAGA LAKE AT SYRACUSE

Gage No. 213

Location.—At the New York Central railroad bridge over the terminal channel in the city of Syracuse.

Records available.—January, 1905, to June 30, 1921.

Gage.—Elevation of water-surface obtained by measuring down from a reference point located on the top of the pier on the east side of the channel at the angle in the pier near the north girder of the bridge. Read by Mr. A. F. Jones.

Accuracy.—Readings taken once daily to tenths.

Coöperation.— Station established and maintained by this Department.

Daily elevation of water-surface (B. C. Datum) of ONONDAGA LAKE AT SYRACUSE,
for the year ended June 30, 1921

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1	363.4	a	363.1	363.5	363.7	364.7	364.2	364.5	364.8	365.6	a	364.1
2	363.4	363.8	362.9	363.7	363.7	365.3	a	364.4	364.9	365.6	364.4	364.0
3	363.4	363.8	362.6	a	363.6	365.6	364.6	364.3	365.0	a	364.5	364.0
4	a	363.8	362.3	364.0	363.6	365.9	364.8	364.3	365.2	365.1	364.6	364.0
5	363.6	363.8	a	364.0	363.6	a	364.9	364.2	365.1	364.9	364.5	a
6	363.6	363.8	363.2	363.8	363.7	365.6	365.0	a	a	364.7	364.4	363.9
7	363.5	363.8	363.3	363.7	a	365.4	364.7	364.4	365.6	364.4	364.3	363.9
8	363.5	a	363.0	363.7	363.8	364.8	364.8	364.4	365.9	364.3	a	363.9
9	363.4	363.8	362.5	363.6	363.7	364.8	a	364.5	366.2	364.4	364.4	363.8
10	363.3	363.8	362.5	a	363.5	364.6	364.5	364.5	366.4	a	364.2	363.7
11	a	363.8	362.6	363.7	363.3	364.6	364.3	364.7	366.5	364.4	364.3	363.6
12	363.5	363.7	a	363.6	363.5	a	364.2	364.6	366.4	364.4	364.4	a
13	363.4	363.6	363.8	363.5	363.6	364.7	364.2	a	a	364.3	364.5	363.8
14	363.3	363.7	363.7	363.5	a	364.8	364.1	364.5	366.0	364.5	364.6	363.8
15	363.4	a	363.6	363.5	363.8	365.0	364.1	364.3	365.9	364.3	a	363.8
16	363.3	363.7	363.6	363.4	363.8	365.1	a	364.2	366.0	364.2	364.4	363.6
17	363.1	363.6	363.4	a	363.9	365.2	364.1	365.1	366.1	a	364.3	363.6
18	a	363.5	363.2	363.6	364.1	365.2	364.3	365.7	366.3	364.5	364.2	363.5
19	363.7	363.5	a	363.8	364.2	a	364.5	365.7	366.1	364.5	364.2	a
20	363.7	363.5	363.4	363.8	364.3	364.6	364.6	a	a	364.6	364.3	363.7
21	363.7	363.4	363.4	363.8	a	364.5	364.6	365.0	366.3	364.3	364.2	363.6
22	363.7	a	363.2	363.8	364.7	364.3	364.7	364.8	366.4	364.2	a	363.3
23	363.6	363.5	363.1	363.6	364.9	364.4	a	364.5	366.2	364.4	364.4	363.3
24	363.6	363.4	363.1	a	365.3	364.5	364.7	364.3	366.0	a	364.2	363.4
25	a	363.3	363.1	363.6	365.4	364.4	364.7	364.4	365.9	365.5	364.1	363.3
26	363.8	363.3	a	363.6	365.3	a	364.6	364.3	365.7	365.5	364.0	a
27	363.6	363.2	363.5	363.5	365.1	364.1	364.6	a	a	365.0	364.1	363.6
28	363.5	363.1	363.4	363.7	a	364.4	364.5	364.5	365.6	364.6	364.0	363.5
29	363.5	a	363.3	363.7	365.3	364.8	364.4	.....	365.6	364.4	a	363.3
30	363.4	363.2	363.3	363.6	364.9	364.5	a	.....	365.5	364.3	364.1	363.5
31	363.3	363.0	.....	a	.....	364.3	364.3	.....	365.4	.....	364.1	.....

a No record.

ONEIDA RIVER BASIN DESCRIPTION

The territory drained by the Oneida river is, in shape, roughly a square of about 40 miles on the side, lying west of the upper portion of the Mohawk drainage basin. From its northeast corner a peninsula-like area of about 80 square miles, drained by the upper portion of East branch, Fish creek, projects northward between the Salmon and Black river drainage areas. Water is diverted into this drainage area from the Black and Mohawk basins through the summit levels of the old Erie and new Barge canals.

ONEIDA RIVER

The Oneida river is a winding stream about $17\frac{3}{4}$ miles long, extending from Brewerton at the outlet of Oneida lake to Three

River Point, where it unites with the Seneca to form the Oswego river.

The Oneida river has been canalized in connection with the construction of the Barge canal.

About 4 miles below Brewerton a dam has been constructed to retain a low navigable surface in Oneida lake and above lock No. 23 at elevation 369.9. This dam is a concrete structure with a straight ogee type crest 415 feet long at elevation 369.63. In the old canal lock a vertical lift-gate has been constructed with a clear span of 30 feet 9 inches and sill at elevation 362.73. The dam was completed in the summer of 1909, and the gate, January 1, 1914.

ONEIDA RIVER AT BREWERTON

Gage No. 185

Location.—At the highway bridge over Oneida river in the village of Brewerton.

Records available.—April 22, 1904, to June 30, 1921.

Gage.—Staff at east end of concrete dock below the highway bridge. Read by Mr. A. R. Merritt.

Discharge.—No discharge obtained.

Accuracy.—Gage read once daily to half-tenths.

Coöperation.—Station established and maintained by this Department.

Daily elevation of water-surface (B. C. Datum) of ONEIDA RIVER AT BREWERTON, for the year ended June 30, 1921

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	370.45	370.45	370.20	370.3	370.2	371.8	371.9	371.0	370.8	372.3	371.6	370.65
2.....	370.40	370.45	370.20	370.3	370.3	371.85	371.8	370.95	370.8	372.25	371.55	370.6
3.....	370.45	370.40	370.20	370.3	370.5	371.9	371.85	370.9	370.8	372.25	371.5	370.6
4.....	370.40	370.40	370.10	370.3	370.35	372.0	371.9	370.9	370.9	372.2	371.45	370.6
5.....	370.35	370.40	370.20	370.4	370.4	372.2	371.9	370.9	370.9	372.15	371.4	370.6
6.....	370.30	370.35	370.10	370.4	370.5	372.4	371.95	370.9	371.0	372.1	371.35	370.55
7.....	370.35	370.35	370.10	370.4	370.45	372.35	372.0	370.9	371.1	372.1	371.35	370.7
8.....	370.35	370.35	370.10	370.4	370.5	372.3	372.0	370.85	371.4	372.0	371.3	370.6
9.....	370.35	370.35	370.20	370.4	370.5	372.25	372.0	370.8	371.8	372.0	371.3	370.55
10.....	370.30	370.30	370.20	370.4	370.5	372.2	371.95	370.8	372.3	371.9	371.25	370.5
11.....	370.35	370.35	370.20	370.4	370.45	372.2	371.9	370.8	372.5	371.8	371.15	370.5
12.....	370.35	370.35	370.40	370.3	370.5	372.2	371.9	370.8	372.55	371.7	371.1	370.5
13.....	370.40	370.40	370.30	370.4	370.6	372.02	371.85	370.8	372.5	371.7	371.0	370.4
14.....	370.35	370.40	370.30	370.4	370.6	372.4	371.8	370.8	372.5	371.6	371.0	370.4
15.....	370.35	370.40	370.30	370.4	370.5	372.4	371.75	370.85	372.5	371.6	370.9	370.4
16.....	370.30	370.40	370.30	370.35	370.6	372.4	371.7	370.85	372.3	371.6	370.9	370.4
17.....	370.30	370.40	370.30	370.35	370.65	372.3	371.65	370.9	372.6	371.55	370.85	370.35
18.....	370.35	370.40	370.30	370.35	370.6	372.3	371.6	371.0	372.6	371.55	370.85	370.35
19.....	370.35	370.50	370.30	370.35	370.7	372.3	371.5	371.1	372.55	371.5	370.8	370.35
20.....	370.50	370.35	370.30	370.3	370.7	372.4	371.4	371.1	372.55	371.5	370.8	370.35
21.....	370.50	370.35	370.30	370.3	371.3	372.35	371.3	371.0	372.6	371.5	370.8	370.3
22.....	370.50	370.30	370.20	370.3	371.3	372.5	371.3	370.9	372.6	371.55	370.75	370.3
23.....	370.45	370.30	370.20	370.3	371.2	372.2	371.3	370.9	372.6	371.6	370.7	370.25
24.....	370.50	370.30	370.20	370.25	371.2	372.2	371.3	370.9	372.6	371.7	370.6	370.2
25.....	370.45	370.25	370.20	370.25	371.35	372.2	371.2	370.8	372.35	371.7	370.55	370.25

**Daily elevation of water-surface (B. C. Datum) of ONEIDA RIVER AT BREWERTON,
for the year ended June 30, 1921 — Continued**

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
26	370.45	370.25	370.30	370.25	371.45	372.2	371.2	370.8	372.4	371.75	370.5	370.25
27	370.45	370.20	370.30	370.2	371.6	372.15	371.15	370.8	372.3	371.7	370.55	370.2
28	370.40	370.20	370.30	370.2	371.6	372.1	371.15	370.7	372.1	371.7	370.55	370.25
29	370.45	370.20	370.30	370.2	371.6	372.1	371.1	.....	372.2	371.65	370.6	370.3
30	370.40	370.20	370.30	370.2	371.7	372.0	371.0	.....	372.3	371.6	370.65	370.3
31	370.40	370.20	.....	370.2	.....	372.0	371.0	.....	372.3	.....	370.7	.....

ONEIDA RIVER AT LOCK No. 23

Gage No. 405

Location.—Above lock No. 23 about $2\frac{1}{2}$ miles west of the village of Brewerton.

Records available.—June 17, 1919, to June 30, 1921.

Gage.—Staff on the upper north approach wall of the lock, just above the gate recess.

Discharge.—See Oneida river at Caughdenoy.

Accuracy.—Gage read twice daily to tenths.

Coöperation.—Station established by this Department. Gage read by employees of the Department of Public Works.

**Daly elevation of water-surface (B. C. Datum) of BAR3E CANAL ABOVE LOCK 23,
NEAR BREWERTON, for the year ended June 30, 1921**

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1	370.30	370.35	370.00	370.3	370.2	371.65	371.75	370.9	370.7	372.05	371.45	370.5
2	370.40	370.30	369.95	370.3	370.55	371.5	371.65	370.9	370.8	372.15	371.45	370.65
3	370.35	370.30	369.95	370.4	370.3	371.95	371.8	370.9	370.9	372.1	371.4	370.55
4	369.95	370.40	370.05	370.35	370.4	371.9	371.85	370.8	370.9	372.1	371.4	370.55
5	370.20	370.35	370.05	370.25	370.25	371.5	371.85	370.8	371.0	372.05	371.45	370.45
6	370.25	370.25	370.25	370.35	370.4	371.95	371.9	370.75	370.95	372.0	371.2	370.45
7	370.30	370.30	369.90	370.35	370.35	372.1	371.9	370.8	371.15	372.0	371.2	370.4
8	370.15	370.30	369.95	370.3	370.35	372.25	371.85	370.8	371.4	371.95	371.1	370.4
9	370.20	370.35	370.00	370.5	370.5	372.25	371.8	370.8	371.75	371.65	371.05	370.4
10	370.35	370.25	370.00	370.3	370.15	372.15	371.8	370.7	372.15	371.75	371.05	370.4
11	370.30	370.35	370.10	370.35	370.5	372.0	371.65	370.75	372.25	371.7	371.15	370.4
12	370.45	370.30	370.25	370.4	370.1	372.0	371.65	370.7	372.4	371.6	371.1	370.3
13	370.35	370.30	370.30	370.3	370.25	372.1	371.55	370.75	372.35	371.7	371.05	370.2
14	370.30	370.40	370.30	370.3	370.35	372.1	371.55	370.7	372.5	371.6	370.9	370.2
15	370.35	370.40	370.30	370.3	370.45	372.1	371.45	370.75	372.45	371.45	370.75	370.3
16	370.25	370.35	370.25	370.3	370.35	372.3	371.4	370.7	372.1	371.4	370.75	370.35
17	370.20	370.30	370.10	370.25	370.6	372.35	371.35	370.75	372.45	371.5	370.75	370.3
18	370.25	370.30	370.20	370.4	370.4	372.2	371.2	370.9	372.4	371.45	370.75	370.3
19	370.40	370.40	370.20	370.25	370.5	372.3	371.3	371.0	372.7	371.4	370.8	370.2
20	370.40	370.30	370.20	370.25	370.7	372.15	371.3	370.95	372.25	371.45	370.7	370.25
21	370.45	370.30	370.25	370.25	370.95	372.15	371.25	370.9	372.1	371.4	370.65	370.25
22	370.40	370.25	370.25	370.15	371.4	372.25	371.1	370.95	372.4	371.35	370.65	370.35
23	370.40	370.15	370.20	370.2	370.85	372.2	371.1	370.9	372.45	371.65	370.6	370.2
24	370.35	370.10	370.20	370.3	371.15	371.9	371.1	370.85	372.45	371.5	370.6	370.2
25	370.35	370.15	370.20	370.2	371.4	372.2	371.1	370.8	372.45	371.7	370.65	370.25
26	370.40	370.20	370.20	370.3	371.5	372.05	371.1	370.7	372.35	371.6	370.5	370.25
27	370.30	370.20	370.30	370.25	371.55	372.0	371.05	370.7	372.2	371.55	370.6	370.15
28	370.40	370.10	370.30	370.25	371.5	371.95	371.0	370.7	372.0	371.6	370.65	370.15
29	370.35	370.15	370.30	370.1	371.55	371.85	371.0	.....	372.15	371.45	370.65	370.15
30	370.25	370.05	370.25	370.1	371.5	371.8	371.0	.....	372.3	371.45	370.6	370.3
31	370.40	370.00	.....	370.05	.....	371.8	370.9	.....	372.2	.....	370.45	.....

ONEIDA RIVER AT LOCK No. 23

Gage No. 406

Location.—Below lock No. 23 about $2\frac{1}{2}$ miles west of the village of Brewerton.

Records available.—June 17, 1919, to June 30, 1921.

Gage.—Staff on the return wall, just west of the power house.

Discharge.—See Oneida river at Caughdenoy.

Accuracy.—Gage read twice daily to tenths.

Coöperation.—Station established by this Department. Gage read by employees of the Department of Public Works.

Daily elevation of water-surface (B. C. Datum) of BARGE CANAL BELOW LOCK 23, NEAR BREWERTON, for the year ended June 30, 1921

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1	363.45	363.50	362.95	363.35	363.65	364.85	365.0	364.4	364.8	365.5	364.35	364.0
2	363.40	363.70	362.75	363.6	363.75	365.2	364.8	364.3	364.9	365.55	364.5	364.0
3	363.50	363.80	362.50	363.7	363.5	365.6	365.05	364.35	365.15	365.4	364.6	363.95
4	363.40	363.80	362.40	363.85	363.6	365.65	365.1	364.3	365.15	365.2	364.7	363.9
5	363.55	363.80	362.70	363.8	363.6	366.05	365.15	364.2	365.2	365.0	364.6	363.95
6	363.55	363.80	363.05	363.75	363.6	365.55	365.2	364.3	365.3	364.95	364.45	363.85
7	363.55	363.80	363.30	363.7	363.65	365.2	365.1	364.3	365.55	364.8	364.25	363.85
8	363.35	363.85	362.90	363.65	363.8	365.0	365.0	364.35	365.9	364.75	364.3	363.8
9	363.30	363.75	362.45	363.6	363.75	365.1	364.85	364.45	366.1	364.6	364.35	363.7
10	363.25	363.80	362.45	363.5	363.45	365.0	364.7	364.55	366.3	364.6	364.2	363.6
11	363.20	363.80	362.55	363.65	363.4	364.65	364.6	364.7	366.45	364.65	364.35	363.55
12	363.50	363.70	363.25	363.6	363.4	364.8	364.45	364.5	366.5	364.55	364.4	363.65
13	363.40	363.70	363.65	363.5	363.3	365.0	364.5	364.4	366.45	364.55	364.45	363.7
14	363.30	363.60	363.55	363.4	363.65	365.1	364.4	364.35	366.3	364.7	364.45	363.7
15	363.50	363.60	363.55	363.45	363.65	365.25	364.35	364.2	366.2	364.5	364.3	363.65
16	363.35	363.55	363.50	363.4	363.8	365.55	364.3	364.2	366.2	364.35	364.35	363.55
17	363.05	363.50	363.25	363.4	363.85	365.5	364.2	364.9	366.6	364.4	364.2	363.6
18	363.25	363.45	363.20	363.65	364.15	365.45	365.1	365.2	366.55	364.6	364.2	363.55
19	363.65	363.50	363.25	363.75	364.3	365.25	364.85	365.2	366.55	364.65	364.25	363.45
20	363.70	363.50	363.40	363.8	364.35	364.95	364.75	365.0	366.5	364.5	364.2	363.6
21	363.70	363.45	363.35	363.75	364.55	364.9	364.65	364.75	366.5	364.35	364.2	363.5
22	363.65	363.30	363.30	363.7	364.85	364.9	364.6	364.6	366.5	364.35	364.25	363.3
23	363.60	363.35	363.10	363.55	364.95	364.75	364.7	364.4	366.45	364.85	364.25	363.25
24	363.50	363.30	363.10	363.55	365.1	364.8	364.6	364.35	366.3	365.25	364.2	363.3
25	363.55	363.25	363.10	363.6	365.3	364.8	364.9	364.55	366.05	365.45	364.1	363.3
26	363.75	363.20	363.20	363.5	365.25	365.4	364.7	364.4	366.0	365.4	364.15	363.4
27	363.55	363.15	363.45	363.55	365.15	366.35	364.55	364.4	365.9	365.05	364.1	363.55
28	363.50	363.00	363.35	363.55	365.0	366.25	364.5	364.65	365.7	364.65	364.1	363.45
29	363.45	362.95	363.30	363.6	365.3	366.5	364.45	.....	365.9	364.5	364.0	363.3
30	363.35	363.20	363.20	363.6	365.0	365.85	364.35	.....	365.5	364.35	364.15	363.4
31	363.40	363.05	.....	363.55	.....	365.3	364.25	.....	365.4	.....	364.05	.....

ONEIDA RIVER AT CHAUGDENOY

Gages Nos. 183 and 184

Location.—At the Caughdenoy dam on the Oneida river.

Drainage area.—1,377 square miles. (Measured on United States Geological Survey topographic maps.)

Records available.—Water-surface elevations, April 22, 1904, to June 30, 1921. Discharge, January 1, 1910, to June 30, 1921. Dam completed during summer of 1909.

Gages.—Above dam, staff on tree on right bank about 50 feet above dam, a slope gage a short distance farther upstream is used in high water. Below dam, staff on west end of concrete retaining wall below lower approach wall to Caughdenoy lock. Gages read by Mr. J. P. Paterson.

Discharge computations.—Flow over dam computed, using coefficient derived from United States Geological Survey experiments, submergence from United States Deep Waterways experiments. Flow through gate and diversion through lock culverts estimated by theoretical calculations.

Control.—Concrete dam with straight ogee type crest 415 feet long at elevation 369.63 and a vertical lift-gate with clear span of 30 feet 9 inches and sill at elevation 362.73.

Extremes of discharge.—1910–1921: Maximum discharge recorded, March 30, 1913, 11,100 second feet. Minimum discharge recorded, January 9 and March 13 and 14, 1914, zero second-feet, water below crest of dam and no reported diversion.

Diversion.—From the Black and Mohawk river basins there is diversion into this drainage area via the summit levels of the old Erie and new Barge canal.

Regulation.—By Oneida lake, which has a surface of 78 square miles.

Accuracy.—Estimated flow within 10 per cent.

Coöperation.—Station established and maintained by this Department.

Daily elevation of water-surface (B. C. Datum) of ONEIDA RIVER ABOVE DAM AT CAUGHDENY, for the year ended June 30, 1921

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	370.2	370.2	370.0	370.15	370.2	371.1	371.3	370.7	370.5	371.4	271.1	370.4
2.....	370.25	370.2	370.0	370.2	370.3	371.0	371.2	370.7	370.5	371.55	371.15	370.55
3.....	370.2	370.2	370.0	370.25	370.1	371.4	371.3	370.7	370.5	371.45	371.15	370.4
4.....	370.0	370.25	370.0	370.3	370.2	371.4	371.3	370.7	370.4	371.5	371.1	370.45
5.....	370.2	370.2	370.0	370.15	370.0	371.35	371.3	370.65	370.7	371.45	371.0	370.35
6.....	370.2	370.2	370.0	370.2	370.25	371.5	371.35	370.6	370.6	371.4	371.0	370.35
7.....	370.2	370.25	370.0	370.3	370.3	371.45	371.4	370.6	370.7	371.4	370.95	370.35
8.....	370.2	370.1	370.0	370.2	370.15	371.5	371.4	370.6	370.9	371.4	370.85	370.3
9.....	370.1	370.1	370.0	370.3	370.25	371.5	371.3	370.4	371.0	371.3	370.9	370.3
10.....	370.2	370.1	370.0	370.2	370.0	371.5	371.4	370.6	371.3	371.25	370.8	370.35
11.....	370.25	370.1	370.1	370.25	370.3	371.45	371.2	370.6	371.4	370.95	370.5	370.15
12.....	370.25	370.2	370.0	370.2	370.1	371.4	371.3	370.6	371.4	371.2	371.0	370.2
13.....	370.3	370.2	370.1	370.25	370.0	371.5	371.15	370.6	371.45	371.15	370.9	370.15
14.....	370.3	370.2	370.2	370.25	370.3	371.5	371.15	370.5	371.5	371.15	370.7	370.0
15.....	370.2	370.2	370.2	370.2	370.3	371.4	371.1	370.5	371.45	371.15	370.65	370.1
16.....	370.1	370.2	370.2	370.2	370.3	371.6	371.1	370.6	371.4	370.95	370.5	370.15
17.....	370.1	370.1	370.0	370.2	370.4	371.6	370.9	370.5	371.45	371.1	370.15	370.25
18.....	370.3	370.25	370.1	370.25	370.3	371.5	371.0	370.7	371.5	371.0	370.5	370.2
19.....	370.25	370.25	370.1	370.2	370.4	371.6	370.9	370.8	371.6	370.95	370.65	370.25
20.....	370.25	370.2	370.1	370.3	370.5	371.6	370.9	370.8	371.4	370.95	370.55	370.1

Daily elevation of water-surface (B. C. Datum) of ONEIDA RIVER ABOVE DAM AT CAUGHDENY for the year ended June 30, 1921 — *Continued*

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
21.	370.3	370.1	370.3	370.2	370.5	371.5	370.95	370.8	371.4	371.0	370.55	370.15
22.	370.3	370.1	370.2	370.1	370.9	371.6	370.8	370.8	371.4	370.95	370.4	370.2
23.	370.3	370.1	370.2	370.1	370.6	371.4	370.8	370.8	371.45	371.3	370.3	370.15
24.	370.3	370.1	370.2	370.2	370.8	371.4	370.8	370.7	371.45	371.3	370.5	370.1
25.	370.25	370.1	370.2	370.2	371.0	371.4	370.85	370.6	371.3	371.25	370.55	370.1
26.	370.2	370.1	370.2	370.3	371.1	371.4	370.9	370.5	371.4	371.15	370.45	370.1
27.	370.3	370.1	370.15	370.2	371.1	371.4	370.85	370.5	371.35	371.3	370.45	370.1
28.	370.25	370.0	370.25	370.1	371.1	371.85	370.8	370.4	371.2	371.1	370.5	370.2
29.	370.25	370.1	370.2	370.0	371.1	371.3	370.8	.....	371.3	371.1	370.45	370.1
30.	370.2	370.1	370.1	370.1	371.1	371.3	370.75	.....	371.6	371.15	370.5	370.25
31.	370.2	370.1	.....	370.0	.....	371.3	370.4	.....	371.5	.....	370.45	.....

Daily elevation of water-surface (B. C. Datum) of ONEIDA RIVER BELOW DAM AT CAUGHDENY, for the year ended June 30, 1921

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.	363.5	363.7	363.0	363.6	363.7	365.5	365.8	364.7	365.0	366.4	365.3	364.1
2.	363.5	363.9	362.8	363.8	363.8	365.7	365.6	364.7	365.0	366.6	365.2	364.2
3.	363.6	363.9	362.7	363.9	363.6	366.4	365.8	364.7	365.2	366.3	365.3	364.1
4.	363.4	363.9	362.6	364.0	363.7	365.4	365.9	364.6	365.3	366.2	365.3	364.0
5.	363.5	364.0	362.9	363.9	363.6	366.3	366.0	364.6	365.3	366.1	365.2	364.2
6.	363.8	363.9	363.5	363.9	363.7	366.4	366.0	364.5	365.4	366.0	365.1	364.1
7.	363.6	363.9	363.3	363.8	363.8	366.1	366.0	364.6	365.8	365.9	365.0	364.1
8.	363.5	363.9	362.9	363.8	363.8	366.2	366.0	364.6	366.0	365.8	364.9	364.0
9.	363.5	363.9	362.6	363.8	363.8	366.2	365.8	364.7	366.5	365.4	364.9	364.0
10.	363.4	364.0	362.7	363.6	363.6	366.3	365.8	364.7	366.8	365.5	364.7	363.9
11.	363.5	363.9	362.9	363.8	363.6	365.8	365.5	365.0	367.2	365.5	365.0	363.7
12.	363.7	363.9	363.2	363.7	363.5	365.9	365.5	364.7	367.3	365.4	365.1	363.7
13.	363.7	363.8	363.7	363.6	363.5	366.1	365.3	364.7	367.3	365.4	365.1	363.9
14.	363.5	363.8	363.8	363.6	363.9	366.2	365.4	364.6	367.3	365.5	364.9	363.6
15.	363.6	363.8	363.8	363.6	364.0	366.2	365.2	364.5	367.3	365.4	364.7	363.7
16.	363.5	363.8	363.7	363.5	364.0	366.6	365.1	364.5	367.2	365.2	364.6	363.7
17.	363.2	363.7	363.2	363.5	364.2	366.2	365.7	364.9	367.4	365.2	364.6	363.7
18.	363.4	363.7	363.3	363.7	364.3	366.4	365.4	365.4	367.5	365.3	364.4	363.5
19.	363.9	363.7	363.3	363.8	364.4	366.3	365.5	365.5	367.8	365.2	364.3	363.6
20.	363.9	363.7	363.5	363.9	364.5	366.4	365.5	365.4	367.4	365.2	364.5	363.6
21.	363.9	363.5	363.6	363.9	364.9	366.3	365.2	365.4	367.4	365.2	364.5	363.6
22.	363.9	363.4	363.4	363.7	365.1	366.3	365.1	365.0	367.5	365.0	364.4	363.5
23.	363.8	363.5	363.3	363.7	365.1	365.9	365.2	364.8	367.4	365.6	364.3	363.4
24.	363.7	363.5	363.3	363.7	365.5	366.1	365.1	364.6	367.5	365.8	364.3	363.4
25.	363.7	363.4	363.5	363.6	365.7	366.2	365.9	364.9	367.2	366.1	364.3	363.4
26.	363.9	363.4	363.3	363.8	365.7	366.5	365.3	364.7	367.2	366.0	364.2	363.5
27.	363.8	363.3	363.6	363.7	365.7	367.0	365.2	364.8	367.1	365.8	364.2	363.6
28.	363.7	363.1	363.5	363.7	365.6	366.9	365.0	364.8	366.8	365.4	364.2	363.6
29.	363.6	363.1	363.5	363.6	365.9	366.9	364.9	.....	366.9	365.4	364.2	363.5
30.	363.5	363.2	363.4	363.7	365.5	366.7	364.8	.....	366.7	365.3	364.2	363.4
31.	363.4	363.1	.....	363.6	.....	366.0	364.8	.....	366.4	.....	364.2	.....

**Mean Daily discharge of ONEIDA RIVER AT CAUGHDENY for the year ending
June 30, 1921**

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	604	630	333	569	668	2,670	3,640	2,020	3,120	3,530	2,630	956
2.....	694	624	343	646	835	2,400	3,340	2,030	3,130	4,010	2,770	1,260
3.....	614	626	339	736	513	3,550	3,640	2,020	3,100	3,690	2,770	956
4.....	345	712	343	813	668	3,550	3,640	2,020	2,880	3,850	2,630	1,350
5.....	624	628	357	565	383	3,410	3,640	1,920	3,570	3,690	2,360	864
6.....	614	620	349	640	744	3,870	3,790	1,800	3,310	3,540	2,360	866
7.....	620	720	341	811	847	3,710	3,940	1,800	3,510	3,530	2,220	866
8.....	608	485	345	646	589	4,170	3,940	1,800	3,990	3,530	1,970	775
9.....	461	469	327	815	750	4,340	3,650	1,380	4,220	3,230	2,090	775
10.....	618	475	335	662	379	4,340	3,950	2,520	5,080	3,080	1,840	866
11.....	714	465	471	724	841	4,190	3,350	2,280	5,330	2,930	2,360	459
12.....	698	634	351	656	513	4,020	3,650	1,790	5,310	2,930	2,360	610
13.....	781	630	477	730	375	4,340	3,210	1,800	5,480	2,790	2,090	533
14.....	616	624	620	728	839	4,340	3,210	1,580	5,660	2,790	1,600	325
15.....	622	626	626	646	839	4,020	3,070	1,580	5,480	2,790	1,490	459
16.....	457	624	612	654	831	4,580	3,070	1,800	5,330	2,240	1,160	535
17.....	463	465	337	660	1,010	4,580	2,530	1,560	5,460	2,650	540	694
18.....	779	710	471	728	833	4,460	2,770	1,990	5,610	2,380	1,158	612
19.....	694	716	471	642	1,020	4,590	2,510	2,240	5,910	2,240	1,490	694
20.....	698	624	467	813	1,210	4,590	2,510	2,240	5,290	2,240	1,270	461
21.....	777	475	787	648	1,210	4,280	2,640	2,250	5,280	2,390	1,270	537
22.....	775	477	620	493	2,130	4,600	2,260	2,260	5,270	2,250	964	614
23.....	781	477	626	499	1,430	3,960	2,260	2,260	5,480	3,240	781	537
24.....	779	469	612	652	1,890	3,950	2,260	2,900	5,250	3,240	1,160	463
25.....	708	475	614	644	2,400	3,960	2,380	3,380	4,580	3,090	1,270	463
26.....	618	477	638	813	2,680	3,940	2,510	3,160	4,900	2,800	1,060	465
27.....	781	479	549	644	2,680	3,900	2,390	3,150	4,760	3,240	1,060	465
28.....	694	341	708	495	2,670	3,750	2,260	2,940	4,330	3,240	1,060	616
29.....	694	469	618	361	2,710	3,590	2,260	.....	4,180	2,660	1,060	465
30.....	606	471	463	493	2,790	3,610	2,150	.....	4,120	2,800	1,160	698
31.....	614	465	.....	361	.....	3,630	1,390	.....	3,800	.....	1,060	.....

Monthly discharge of ONEIDA RIVER AT CAUGHDENY for the year ending June 30, 1921
[Drainage area, 1,377 square miles.]

MONTH	DISCHARGE IN SECOND-FEET				RUN-OFF
	Maximum	Minimum	Mean	Per square mile	Depth in inches on drainage area
July.....	781	345	650	.472	.544
August.....	720	341	554	.402	.463
September.....	787	327	485	.352	.393
October.....	815	361	644	.468	.539
November.....	2,790	375	1,243	.902	1.006
December.....	4,600	2,400	3,960	2.876	3.315
January.....	3,950	1,390	2,960	2.150	2.480
February.....	3,380	1,350	2,160	1.568	1.632
March.....	5,910	2,880	4,600	3.340	3.850
April.....	4,010	2,240	3,000	2.180	2.430
May.....	2,770	540	1,650	1.197	1.380
June.....	1,350	325	673	.489	.546
The year.....	5,910	325	1,880	1.366	18.578

ONEIDA RIVER AT OAK ORCHARD

Gage No. 182

Location.—At Schroepfels bridge across the Oneida river at Oak Orchard, about $7\frac{5}{8}$ miles above the mouth of the river.

Records available.—Discharge, September 1, 1902, to December 31, 1909. Water-surface elevations, April 23, 1904, to June 30, 1921.

Gage.—Staff on the lower end of the south side of the old pier near the left bank. Read by Mr. L. Sitterly.

Discharge.—No discharge obtained.

Accuracy.—Gage read once daily to quarter-tenths.

Coöperation.—Station established and maintained by this Department. The discharge station was maintained by the United States Geological Survey.

Daily elevation of water-surface (B. C. datum) of ONEIDA RIVER AT OAK ORCHARD, for the year ended June 30, 1921

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	363.50	363.68	363.10	363.40	363.63	364.90	365.38	364.40	364.70	365.30	364.43	364.05
2.....	363.45	363.75	362.92	363.55	363.70	365.10	365.30	364.40	364.75	365.30	364.50	364.00
3.....	363.40	363.38	362.65	363.78	363.70	365.25	365.25	364.48	365.00	365.20	364.58	364.00
4.....	363.45	363.30	362.60	363.75	363.67	365.52	365.10	364.48	364.93	365.08	364.50	363.90
5.....	363.45	363.35	362.55	363.77	363.65	365.40	364.90	364.38	365.03	364.90	364.40	363.90
6.....	363.40	363.38	363.10	363.75	363.70	365.10	364.93	364.30	365.20	364.88	364.35	363.85
7.....	363.35	363.32	363.30	363.75	363.80	364.80	364.95	364.30	365.40	364.73	364.35	363.83
8.....	363.32	363.50	363.00	363.70	363.75	364.60	364.90	364.35	365.60	364.80	364.33	363.80
9.....	363.30	363.62	362.50	363.65	363.67	364.70	364.70	364.38	365.70	364.65	364.30	363.75
10.....	363.28	363.70	262.50	363.62	363.55	364.60	364.53	364.40	365.90	364.65	364.28	363.70
11.....	363.30	363.75	362.75	363.60	363.50	364.48	364.38	364.40	366.00	364.50	364.33	363.70
12.....	363.55	363.68	363.25	363.65	363.40	364.42	364.33	364.40	366.13	364.40	364.38	363.70
13.....	363.45	363.62	363.75	363.53	363.45	364.50	364.30	364.40	366.05	364.53	364.38	363.68
14.....	363.35	363.62	363.70	363.50	363.78	364.80	364.20	364.33	365.93	364.40	364.35	363.65
15.....	363.30	363.60	363.60	363.45	363.80	364.70	364.15	364.45	365.80	364.28	364.35	363.65
16.....	363.30	363.58	363.55	363.45	363.82	364.70	364.05	364.48	365.80	364.15	364.30	363.65
17.....	363.35	363.55	363.35	363.45	364.00	364.68	364.03	364.48	365.90	364.40	364.25	363.65
18.....	363.45	363.50	363.25	363.65	364.10	364.62	364.10	364.88	366.00	364.60	364.18	363.65
19.....	363.45	363.50	363.30	363.68	364.18	364.55	364.35	365.15	366.00	364.65	364.15	363.63
20.....	363.70	363.48	363.42	363.70	364.27	364.60	364.55	365.00	366.10	364.50	364.18	363.60
21.....	363.72	363.45	363.40	363.72	364.45	364.60	364.53	364.80	366.20	364.38	364.20	363.58
22.....	363.70	363.40	363.52	363.68	364.70	364.53	364.50	364.60	366.05	364.25	364.23	363.55
23.....	363.62	363.40	363.50	363.62	364.87	364.50	364.45	364.20	365.96	364.50	364.30	363.48
24.....	363.52	363.42	363.52	363.60	365.18	364.50	364.40	364.15	366.08	364.65	364.25	363.40
25.....	363.60	363.32	363.40	363.60	365.22	364.50	364.53	364.35	366.70	364.60	364.20	363.40
26.....	363.60	363.25	363.25	363.70	365.18	364.62	364.70	364.40	365.65	364.60	364.18	363.40
27.....	363.65	363.18	363.28	363.70	365.00	365.48	364.63	364.40	365.05	364.70	364.20	363.38
28.....	363.52	363.10	363.30	363.70	364.82	365.80	364.58	364.50	365.35	364.63	364.15	363.38
29.....	363.48	363.15	363.30	363.68	365.23	365.70	364.50	.....	365.03	364.48	364.08	363.35
30.....	363.40	363.58	363.30	363.65	365.15	365.60	364.48	.....	365.30	364.35	364.08	363.33
31.....	363.38	363.22	.....	363.57	.....	365.50	364.45	.....	365.25	.....	364.05	.....

ONEIDA RIVER AT THREE RIVER POINT

Gage No. 181

Location.—At Three River Point, the junction of the Oneida and Seneca rivers.

Records available.—April 13, 1904, to June 30, 1921.

Gage.—Staff in two sections, lower section on south face of east end of boat landing of Three River dock; upper section on west wing wall of south abutment of the highway bridge over the Oneida river. Read by Mr. Fred Chamberlain.

Discharge.—No discharge obtained.

Accuracy.—Gage read once daily to tenths.

Coöperation.—Station established and maintained by this Department.

Daily elevation of water-surface (B. C. datum) of ONEIDA RIVER AT THREE RIVER POINT, for the year ended June 30, 1921

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	363.35	363.50	363.00	363.40	363.65	364.50	364.00	364.30	364.50	364.95	364.10	364.00
2.....	363.30	363.75	362.90	363.60	363.75	364.90	364.00	364.10	364.55	365.00	364.20	364.00
3.....	363.30	363.80	362.60	363.70	363.60	365.15	364.35	364.10	364.70	364.90	364.40	363.95
4.....	363.40	363.80	362.35	363.90	363.60	365.20	364.50	364.10	364.75	364.60	364.40	363.90
5.....	363.50	363.80	362.65	363.80	363.60	365.10	364.55	364.00	364.90	364.60	364.40	363.95
6.....	363.70	363.80	363.15	363.80	363.60	364.80	364.60	364.10	364.90	364.55	364.30	363.90
7.....	363.55	363.80	363.35	363.75	363.70	364.70	364.50	364.20	365.10	364.45	364.20	363.90
8.....	363.45	363.80	363.30	363.70	363.85	364.15	364.40	364.20	365.20	364.25	364.20	363.85
9.....	363.40	363.80	362.55	363.60	363.65	364.30	364.30	364.25	365.30	364.30	364.20	363.75
10.....	363.30	363.85	362.50	363.50	363.30	364.35	364.25	364.30	365.80	364.30	364.00	363.75
11.....	363.25	363.80	362.60	363.65	363.35	364.00	364.00	364.55	365.65	364.40	364.20	363.75
12.....	363.50	363.70	363.10	363.55	363.30	364.20	364.00	364.35	365.55	364.40	364.25	363.65
13.....	363.40	363.65	363.70	363.50	363.50	364.35	364.00	364.25	365.45	364.25	364.40	363.80
14.....	363.35	363.55	363.60	363.40	363.70	364.40	363.95	364.30	365.20	364.45	364.40	363.70
15.....	363.35	363.60	363.55	363.45	363.80	364.60	363.95	364.10	365.20	364.30	364.30	363.65
16.....	363.25	363.65	363.55	363.40	363.80	364.70	363.85	364.00	365.15	364.15	364.25	363.60
17.....	363.10	363.55	363.35	363.40	363.90	364.80	363.75	364.65	365.65	364.25	364.20	363.50
18.....	363.10	363.50	363.20	363.60	364.10	364.70	364.15	365.00	365.60	364.40	364.00	363.45
19.....	363.60	363.50	363.25	363.75	364.10	364.40	364.35	365.05	365.40	364.45	364.00	363.50
20.....	363.70	363.50	363.45	363.80	364.20	364.15	364.40	364.95	364.30	364.45	364.10	363.60
21.....	363.70	363.45	363.40	363.80	364.40	364.20	364.40	364.50	365.50	364.20	364.10	363.55
22.....	363.70	363.45	363.20	363.75	364.65	364.00	364.40	364.45	365.45	364.10	364.10	363.30
23.....	363.60	363.45	363.10	363.55	364.70	364.10	364.50	364.25	365.40	364.35	364.20	363.35
24.....	363.50	363.35	363.10	363.55	364.90	364.10	364.30	364.00	365.30	364.90	364.10	363.35
25.....	363.55	363.30	363.15	363.60	365.00	364.20	364.40	363.95	365.20	365.15	364.00	363.30
26.....	363.80	363.25	363.25	363.55	364.90	364.00	364.40	364.10	365.10	365.20	363.95	363.35
27.....	363.60	363.20	363.50	363.60	364.80	363.85	364.30	364.00	365.00	364.70	364.05	363.60
28.....	363.50	363.10	363.40	363.70	364.65	364.20	364.25	364.20	364.85	364.30	364.00	363.50
29.....	363.45	363.05	363.30	363.60	365.10	364.60	364.20	.....	365.00	364.30	363.90	363.30
30.....	363.35	363.20	363.25	363.55	364.70	364.30	364.25	.....	364.90	364.10	364.00	363.45
31.....	363.30	363.10	.....	363.55	.....	364.10	363.90	.....	364.85	.....	364.10	.....

ONEIDA LAKE

Oneida lake, with a water-surface of 78 square miles, is about $20\frac{3}{4}$ miles long and 4 to 5 miles wide the greater part of its length. Its depth varies from 20 to 50 feet, with large shoal areas. The total drainage area above its outlet is 1,353 square miles, of which the lake surface constitutes $5\frac{3}{4}$ per cent.

The Barge canal traverses the length of the lake. A low navigable surface is maintained at elevation 369.9 by the Caughdenoy dam located 4 miles down the Oneida river, a description of which is given under the title, Oneida river.

For elevation of west end of Oneida lake, see Oneida river at Brewerton.

The following table gives the elevations of extreme high and low-water surface each year of Oneida lake, as indicated by gages at Brewerton at the west, and Sylvan Beach at the east end of the lake. The gage at Brewerton is about 1,500 feet down the outlet, while that at Sylvan Beach is about 800 feet up Fish creek from the lake. The difference between extreme surface at each end of the lake is probably mainly due to wind, supplemented by such slight slope between the gage and lake as may occur during times of large flow.

Annual high and low water-surface elevation of ONEIDA LAKE

YEAR	BREWERTON			SYLVAN BEACH		
	SURFACE ELEVATION		Range	SURFACE ELEVATION		Range
	High	Low		High	Low	
			<i>Feet</i>			<i>Feet</i>
1904.....	374.0	369.1	4.9	.....	.....	.....
1905.....	374.9	369.9	5.0	375.4	370.5	4.9
1906.....	372.8	368.7	4.1	373.1	368.9	4.2
1907.....	372.9	369.1	3.8	373.1	369.2	3.9
1908.....	373.4	368.6	4.8	373.7	368.5	5.2
1909.....	374.5	370.0	4.5	374.5	369.8	4.7
1910.....	373.9	370.09	3.81	374.0	370.0	4.0
1911.....	374.2	370.2	4.0	374.3	369.7	4.6
1912.....	375.3	370.2	5.1	376.9	370.0	6.9
1913.....	375.3	369.6	5.7	377.0	369.3	7.7
1914.....	374.2	369.7	4.5	375.8	369.8	6.0
1915.....	372.5	370.39	2.11	371.6	369.5	2.1
1916.....	374.0	369.3	4.7	374.0	369.9	4.1
1917.....	374.5	369.0	5.5	374.2	369.9	4.3
1918.....	373.25	370.1	3.15	373.0	369.95	3.05
1919.....	373.5	370.1	3.4	373.9	370.3	3.6
1920.....	374.4	370.1	4.3	374.8	369.7	5.1

ONEIDA LAKE AT SYLVAN BEACH

Gage No. 186

Location.—On Railroad street bridge over Fish creek at Sylvan Beach, about 800 feet from Oneida lake.

Records available.—April 1, 1905, to June 30, 1921.

Gage.—Staff in two sections, lower section on corner of crib dock on right bank of Fish creek, just above Railroad street bridge; upper section on north face of north abutment of same bridge. Read by Mr. L. A. Withey.

Discharge.—No discharge obtained.

Accuracy.—Gage read once daily to half-tenths.

Coöperation.—Station established and maintained by this Department.

Daily elevation of water-surface (B. C. datum) of ONEIDA LAKE ABOVE R. R. ST.
BRIDGE AT SYLVAN BEACH, for the year ended June 30, 1921

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	370.35	370.45	370.2	b	370.3	371.55	371.85	371.0	370.85	372.25	371.55	370.65
2.....	370.35	370.4	370.1	b	370.1	371.8	371.85	370.95	370.9	372.2	371.5	370.6
3.....	370.35	370.4	370.1	b	370.35	371.85	371.85	370.9	370.95	372.2	371.45	370.6
4.....	370.35	370.35	370.1	b	370.25	371.9	371.9	370.9	371.05	372.15	371.4	370.55
5.....	370.3	370.35	370.1	370.4	370.5	372.15	371.95	370.85	371.05	372.15	371.35	370.6
6.....	370.25	370.3	370.05	370.45	370.45	372.4	372.0	370.9	371.1	372.05	371.35	370.55
7.....	370.2	370.3	370.1	370.4	370.4	372.55	372.0	370.9	371.3	371.95	371.3	370.5
8.....	370.35	370.3	370.15	370.35	370.45	372.45	372.0	370.9	371.55	371.9	371.25	370.45
9.....	370.25	370.25	370.0	370.35	370.35	372.55	371.95	370.85	372.0	371.9	371.3	370.4
10.....	370.35	370.3	370.05	370.35	370.65	372.25	371.9	370.85	372.3	371.85	371.15	370.35
11.....	370.3	370.3	370.1	370.3	370.4	372.2	371.8	370.85	372.45	371.8	371.05	370.4
12.....	370.35	370.35	370.25	370.3	370.75	372.1	371.75	370.85	372.5	371.75	370.95	370.45
13.....	370.4	370.35	370.35	370.3	370.75	371.95	371.7	370.85	372.6	371.65	370.95	370.35
14.....	370.45	370.4	370.4	370.3	370.45	371.8	371.65	370.8	372.6	371.55	370.9	370.4
15.....	370.45	370.4	370.4	370.25	370.4	372.1	371.6	370.8	372.6	371.5	370.85	370.4
16.....	370.45	370.4	370.35	370.25	370.65	372.4	371.55	370.85	372.65	371.5	370.9	370.4
17.....	370.35	370.35	370.35	370.3	370.6	372.55	371.5	370.9	372.65	371.45	370.8	370.3
18.....	370.35	370.3	370.3	370.3	370.6	372.55	371.45	370.95	372.7	371.5	370.85	370.3
19.....	370.4	370.25	370.35	370.3	370.7	372.45	371.4	371.0	372.55	371.55	370.75	370.35
20.....	370.45	370.2	370.3	370.25	370.8	372.4	371.35	371.1	372.6	371.5	370.7	370.3
21.....	370.45	370.25	370.25	370.25	370.6	372.3	371.25	371.1	372.65	371.45	370.7	370.25
22.....	370.5	370.25	370.25	370.35	370.7	372.05	371.25	371.05	372.65	371.45	370.65	b
23.....	370.5	370.25	370.25	370.3	370.9	372.15	371.3	370.95	372.6	371.15	370.65	b
24.....	370.6	370.2	370.25	370.2	371.2	372.25	371.3	370.9	372.45	371.55	370.6	b
25.....	370.55	370.2	370.25	370.25	371.5	372.3	371.3	370.9	372.45	371.6	370.65	b
26.....	370.5	370.15	370.25	370.15	371.55	372.2	371.25	370.85	372.35	371.65	370.6	b
27.....	370.45	370.15	370.2	370.2	371.55	372.1	371.2	370.8	372.35	371.65	370.6	370.3
28.....	370.4	370.1	b	370.25	371.55	372.1	371.15	370.8	372.4	371.65	370.55	b
29.....	370.4	370.05	b	370.25	371.55	372.0	371.1	.....	372.3	371.6	370.55	b
30.....	370.45	370.05	b	370.27	371.55	371.95	371.05	.....	372.2	371.6	370.6	b
31.....	370.35	370.15	.....	370.25	.....	371.9	371.05	.....	372.2	.....	370.65	.....

b Gage gone.

BLACK RIVER DRAINAGE BASIN**BLACK RIVER****DESCRIPTION**

Black river rises in the western part of Hamilton county, flows southwestward across Herkimer county into Oneida county, turns near Forestport and runs somewhat west of north through Lewis county to eastern Jefferson county and then flows westward to Black River bay, at the eastern extremity of Lake Ontario. Its total drainage area is 1,930 square miles. The upper part of the basin is very rugged and mountainous, contains a large number of lakes and is in a part of the Adirondack forest.

The mean annual precipitation is about 40 inches, ranging from 55 inches in the extreme headwaters to perhaps 30 inches near Lake Ontario. The winters are generally quite severe and the stream flow is affected by ice for periods of several months.

The regimen of the river is controlled by storage on its upper tributaries (including Beaver river at Beaver River), a series of reservoirs on the headwaters of Moose river and additional reservoirs at Forestport and on the headwaters of the main river.

Water is diverted from Black river through Forestport feeder to supply the Black River canal at Boonville. A portion of this diverted water flows northward from Boonville and enters Black river again at Lyons Falls; the remainder flows southward through the Black River canal and enters the Erie canal at Rome.

BLACK RIVER NEAR BOONVILLE

Location.—At highway bridge, about 1 mile above mouth of Sugar river, 2 miles northeast of Boonville, Oneida county, and 2 miles, by river, downstream from Hawkinsville.

Drainage area.—303 square miles (measured on topographic maps).

Records available.—February 16, 1911, to June 30, 1921.

Gage.—Chain near center of left span, downstream side of bridge; staff gage on right abutment used for high-water readings; read by W. D. Charbonneau.

Discharge measurements.—Made from a cable about half a mile above gage, or by wading near the gage.

Channel and control.—Rough and full of boulders; permanent.

Extremes of discharge.—Maximum stage recorded during year, 9.20 feet at 8 A. M., December 15 (discharge, 4,410 second-feet); minimum stage recorded, 3.10 feet at 8 A. M., October 25 and 8 A. M., May 24 (discharge, 34 second-feet).

1911–1921: Maximum stage (determined by leveling from flood mark), about 12.5 feet during night of March 28, 1913

(discharge, about 10,000 second-feet); minimum stage recorded, 2.4 feet at 5 p. m., August 26, 1918 (discharge, about 5 second-feet).

Ice.—Stage-discharge relation affected by ice.

Regulation and diversion.—The State dam at Forestport, about 8 miles upstream, provides a reservoir with a capacity of about 2,000,000,000 cubic feet. Water is diverted from this reservoir during the navigation season through the Forestport feeder, flowing west to a basin in Boonville. The Black River canal flows north from this basin, entering Black river at the foot of Lyons Falls. A spillway from the basin overflows into Mill creek, a tributary of Black river. Water flowing through these two channels returns to the river below the gaging station, thus passing around it. The Black River canal also flows south from Boonville, passing out of the Black river drainage and entering the summit level of the Erie canal (or Barge canal) at Rome.

Occasional discharge measurements have been made at three points to indicate the distribution of the diverted water. The water entering Boonville through the Forestport feeder has been measured at the highway bridge, about 1 mile northeast of Boonville. During October, 1915, two water-stage recorders were installed on this canal to obtain a continuous record of flow, which is published as a separate station, "Forestport feeder near Boonville." The water flowing north from the basin through the Black River canal has been measured at the highway bridge, just below the lock into this canal near the railroad station. The water flowing south from the basin has been measured at a private farm bridge, about 1 mile southeast of Boonville. During September, 1915, two water-stage recorders were installed on this canal to obtain a continuous record of the flow, which is published as a separate station, "Black River canal (flowing south) near Boonville."

Accuracy.—Stage-discharge relation practically permanent, except as affected by ice during most of January and February. Rating curve well defined between 35 and 2,800 second-feet and fairly well defined between 2,800 and 4,500 second-feet. Gage read to hundredths twice daily. Daily discharge ascertained by applying mean daily gage height to rating table. Records good, except for periods when the stage-discharge relation was affected by ice, for which they are fair.

Coöperation.—Station maintained by the United States Geological Survey in coöperation with the State Engineer and Surveyor.

Discharge measurements of BLACK RIVER NEAR BOONVILLE, during the year ending June 30, 1921

DATE	Made by	Gage height	Discharge
		<i>Feet</i>	<i>Sec.-ft.</i>
July 24.....	S. M. Currier.....	4.02	148
Feb. 28.....	S. M. Currier.....	4.90	345
May 17.....	Howe and Currier.....	4.30	204

a Backwater from ice.

Daily discharge, in second-feet, of BLACK RIVER NEAR BOONVILLE, for the year ending June 30, 1921

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	72	119	72	535	97	920	580	420	795	2,620	920	305
2.....	59	238	72	580	136	1,940	630	420	1,060	1,740	630	275
3.....	78	127	90	630	205	2,620	795	440	990	1,540	612	164
4.....	111	104	84	735	335	2,160	920	440	855	1,640	490	127
5.....	104	111	145	735	490	2,500	920	400	735	1,210	580	119
6.....	164	90	227	680	512	1,460	1,210	320	1,060	1,060	558	119
7.....	164	84	238	630	580	1,060	1,460	300	1,460	920	410	111
8.....	305	90	275	490	585	680	1,060	340	2,380	1,060	335	127
9.....	580	59	250	450	490	680	680	380	3,360	1,060	352	111
10.....	535	78	227	305	490	630	680	320	3,110	1,460	390	184
11.....	410	70	205	164	535	605	920	340	2,860	1,540	580	97
12.....	450	56	227	164	580	795	990	340	2,740	1,940	305	63
13.....	855	84	194	184	535	920	795	380	2,740	2,160	290	250
14.....	1,060	174	227	136	512	2,500	750	300	2,620	2,380	320	335
15.....	605	227	290	97	450	4,140	700	280	2,740	2,270	227	335
16.....	305	111	275	68	370	3,360	800	280	2,500	2,860	262	250
17.....	410	154	227	66	320	2,620	850	260	2,380	2,380	205	227
18.....	535	205	320	72	370	1,370	900	300	2,740	1,940	227	174
19.....	490	205	410	78	335	1,460	750	340	2,740	1,740	184	127
20.....	580	275	275	63	305	1,460	700	340	2,980	1,640	145	119
21.....	630	275	238	84	335	920	600	460	2,860	1,460	184	119
22.....	410	305	227	97	370	630	650	500	2,740	1,140	154	104
23.....	227	305	250	57	470	535	750	460	2,380	990	70	72
24.....	184	250	205	40	450	580	750	400	2,620	990	36	78
25.....	154	227	227	37	535	605	700	380	3,360	855	111	78
26.....	97	194	250	53	490	535	600	360	3,110	735	127	238
27.....	104	145	250	84	490	512	500	340	2,980	855	227	450
28.....	90	174	305	97	630	630	490	380	2,740	990	370	535
29.....	70	127	370	111	558	605	490	.....	2,740	1,060	470	535
30.....	59	56	490	84	630	535	490	.....	2,740	1,140	370	490
31.....	63	51	.....	72	.....	490	440	.....	3,110	.....	335	.....

NOTE.—Discharge January 14 to February 28, determined from gage-heights corrected for ice effect from 1 discharge measurement study of weather record and comparison with records at other stations in same drainage.

Monthly discharge of BLACK RIVER NEAR BOONVILLE, for the year ending June 30, 1921
[Drainage area, 303 square miles]

MONTH	DISCHARGE IN SECOND-FEET				RUN-OFF
	Maximum	Minimum	Mean	Per square mile	Depth in inches on drainage area
July.....	1,080	59	321	1.06	1.22
August.....	805	51	154	.508	.59
September.....	490	72	238	.785	.88
October.....	735	37	248	.818	.94
November.....	630	97	438	1.45	1.62
December.....	4,140	490	1,300	4.29	4.95
January.....	1,460	440	757	2.50	2.88
February.....	500	260	365	1.20	1.25
March.....	3,360	735	2,390	7.89	9.10
April.....	2,860	735	1,510	4.98	5.56
May.....	920	36	335	1.11	1.28
June.....	535	63	211	.696	.78
The year.....	4,140	36	693	2.29	31.05

NOTE.—Water diverted past this station by the Forestport feeder is not included in the above table.

BLACK RIVER AT WATERTOWN

Location.—At Vanduzee Street bridge in Watertown, Jefferson county. No important tributary enters the river below this point.

Drainage area.—1,890 square miles (measured on topographic maps).

Records available.—July 18, 1920, to June 30, 1921.

Gage.—Vertical staff attached to downstream side of right bridge abutment, and inclined staff on right bank about 150 feet below; read by employee of Black River Regulating District.

Discharge measurements.—Made from cable just below inclined gage.

Channel and control.—Channel rocky and rough, control permanent.

Extremes of discharge.—Maximum stage recorded during period of record, 8.78 feet at 4:30 P. M., March 11 (discharge, 23,100 second-feet); minimum stage recorded, 0.46 foot at 8:40 A. M., September 7 (discharge, 284 second-feet).

Ice.—Stage-discharge relation probably not affected by ice.

Regulation.—Seasonal distribution of flow is regulated by Beaver river flow, Fulton Chain lakes, Forestport reservoir and other storage reservoirs in the upper part of the drainage basin. Some diurnal fluctuation at low stages, due to mills and power plants above the station.

Diversions.—Water is diverted from Black river into the Forestport feeder at Forestport. A part of this water returns to the river through various spillways and through the Black River

canal (flowing north); the rest passes out of the drainage basin through the Black River canal (flowing south); the record at the station on Black River canal (flowing south) at Boonville indicates the amount of this diversion. See also "Regulation and Diversion" in description of station on Black river near Boonville.

Accuracy.—Rating fairly well defined between 400 and 25,000 second-feet. Daily discharge ascertained by applying mean daily gage height to rating table. Records, good.

Coöperation.—Station established by United States Geological Survey in coöperation with State Engineer and Surveyor and Black River Regulating District.

NOTE.—The station at Black river was discontinued on July 17th, on account of diversion around the gage by the power canal of the new Northern New York Utilities plant. A comparable record is continued at the Watertown station.

Discharge measurements of BLACK RIVER AT WATERTOWN, during the year ending
June 30, 1921

DATE	Made by	Gage height	Dis-charge
		<i>Feet</i>	<i>Sec.-ft.</i>
July 15a.....	Covert and Currier.....	2.52	296
July 20a.....	S. M. Currier.....	4.31	1,850
Oct. 21.....	Currier and Cooper.....	1.57	1,260
Oct. 21.....	Lamoureux and Burns.....	1.56	1,260
Nov. 18.....	Covert and Harrington.....	2.72	3,440
Nov. 24.....	Currier and Burns.....	6.70	8,300
Nov. 24.....	Currier and Burns.....	4.78	8,150
Dec. 16.....	Currier and Burns.....	6.14	12,900
Dec. 16.....	Currier and Burns.....	8.17	12,900
Jan. 26.....	S. M. Currier.....	2.66	3,170
Mar. 10.....	A. W. Harrington.....	7.72	18,700
Mar. 11.....	A. W. Harrington.....	8.38	21,600
April 20.....	A. W. Harrington.....	4.48	7,500
April 20.....	A. W. Harrington.....	4.48	7,500
April 21.....	A. W. Harrington.....	4.40	6,880

a Measurements made at station at Black River and do not include flow in Northern New York Utilities power canal.

Daily discharge, in second-feet, of BLACK RIVER AT WATERTOWN, for the year ending
June 30, 1921

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	764	1,020	1,140	2,370	1,500	2,960	3,160	2,370	3,160	12,000	3,580	2,370
2.....	620	960	1,080	3,790	2,460	5,350	3,160	2,000	4,000	11,400	4,440	2,090
3.....	879	1,280	1,210	3,580	2,560	7,050	5,580	1,830	5,580	10,500	4,890	1,660
4.....	654	1,210	1,280	2,960	4,000	7,800	6,060	2,090	6,300	10,200	4,440	1,350
5.....	164	1,350	1,080	2,000	4,220	7,050	6,550	1,830	6,060	9,000	4,000	1,080
6.....	1,600	1,080	650	1,740	4,000	10,000	7,300	1,830	5,580	7,800	3,370	850
7.....	1,920	1,210	700	2,000	2,460	10,200	5,580	2,000	8,100	6,800	2,960	1,210
8.....	1,920	750	1,140	1,660	2,370	9,600	4,890	2,280	9,000	5,820	2,370	1,080
9.....	2,140	1,020	960	1,740	2,280	8,400	4,440	2,000	14,000	5,120	2,180	850
10.....	1,130	1,280	1,140	1,080	2,180	7,550	3,580	2,180	19,600	5,350	2,370	905

**Daily discharge, in second-feet, of BLACK RIVER AT WATERTOWN, for the year ending
June 30, 1921 — Continued**

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
11.	1,310	960	1,350	1,210	2,370	5,350	3,160	2,180	22,800	5,350	2,000	750
12.	764	1,140	1,210	1,350	2,370	4,890	3,160	2,370	21,600	5,350	2,000	1,020
13.	1,040	1,420	1,210	1,350	2,280	4,660	2,460	2,180	18,800	4,220	2,000	1,350
14.	1,040	1,920	2,000	960	2,000	5,820	2,560	1,830	14,800	3,580	1,830	1,660
15.	1,400	2,180	1,740	1,210	2,090	11,400	2,560	2,290	13,200	3,580	1,580	1,660
16.	1,800	2,370	1,830	1,210	2,000	12,800	2,660	2,180	13,600	3,790	1,420	1,500
17.	2,000	2,000	1,350	800	2,090	15,200	3,160	3,790	14,000	4,660	1,830	1,210
18.	1,580	1,830	1,500	1,210	3,580	13,200	3,370	5,120	14,400	6,300	1,580	1,140
19.	1,420	1,740	960	1,020	4,000	10,500	3,160	4,440	14,400	7,300	1,850	905
20.	3,370	1,420	1,210	1,350	3,580	9,600	2,460	3,790	15,600	7,550	1,350	800
21.	3,790	1,350	1,210	1,140	2,760	6,550	2,560	3,370	17,200	7,300	1,210	960
22.	3,580	1,210	1,280	1,350	2,960	4,890	2,960	2,960	18,000	6,300	1,210	905
23.	2,460	960	1,280	1,280	4,890	5,580	3,790	2,760	20,000	5,820	850	905
24.	1,920	1,140	1,210	900	8,400	6,800	4,000	2,280	18,400	5,580	1,140	960
25.	1,740	1,210	1,140	1,280	8,400	5,350	4,000	2,180	14,800	5,350	1,420	800
26.	1,210	1,280	1,020	850	7,300	4,890	3,370	2,090	14,800	5,120	1,500	850
27.	1,350	1,080	1,080	1,350	5,820	4,000	2,760	2,180	15,200	4,440	1,740	650
28.	1,280	1,080	1,210	1,350	4,440	3,790	2,280	2,370	16,000	3,790	1,580	1,080
29.	1,420	700	1,350	1,280	4,000	3,580	2,180	.....	15,200	3,370	1,350	1,210
30.	960	905	1,660	1,580	3,580	3,580	2,280	.....	14,400	3,160	1,740	1,280
31.	1,140	1,140	.....	900	.....	3,790	2,180	.....	12,800	.....	2,760	.....

NOTE.—Daily discharge, July 1-17, from station at Black River, which was discontinued on the latter date. Discharge, July 15-17 estimated from gage-heights and record of operation of new Northern New York Utilities power plant.

Monthly discharge of BLACK RIVER AT WATERTOWN, for the year ending June 30, 1921
[Drainage area, 1,890 square miles.]

MONTH	DISCHARGE IN SECOND-FEET				RUN-OFF Depth in inches on drainage area
	Maximum	Minimum	Mean	Per square mile	
July. ....	.....	.....	1,560	0.825	.95
August.	2,370	700	1,300	.688	.79
September.	2,000	650	1,240	.656	.73
October.	3,790	800	1,540	.815	.94
November.	8,400	1,600	3,560	1.88	2.10
December.	15,200	2,960	7,170	3.79	4.37
January.	7,300	2,180	3,590	1.90	2.19
February.	5,120	1,830	2,530	1.34	1.40
March.	22,800	3,160	13,600	7.20	8.30
April.	12,000	3,160	6,200	3.28	3.68
May.	4,890	850	2,190	1.16	1.34
June.	2,370	650	1,170	.619	.69
The year.	22,800	650	3,820	2.02	27.46

NOTE.—See "Regulation" and "Diversions" in station description, and foot note to daily-discharge table.

FORESTPORT FEEDER NEAR BOONVILLE

Location.—Slope station at lower end of feeder, above point where it enters the basin at Boonville, Oneida county.

Records.—Occasional discharge measurements, 1900 and 1905-1915; continuous record, October 30, 1915, to June 30, 1921.

Gages.—Two Gurley 7-day graph water-stage recorders, with natural scale for gage heights. Gage No. 1 is at downstream end of left abutment of steel highway bridge in village of Hawkinsville; gage No. 2 is on left bank, just below a farm bridge about 1 mile above the basin at Boonville; they are 2.53 miles apart. The float wells are $1\frac{1}{2}$ by 2 feet, inside dimensions, and the bottoms are about $1\frac{1}{4}$ feet below normal elevation of water surface in canal. These gages and the two in the Black River canal (flowing south), near Boonville, are all set at the same datum; recorders inspected by Ralph Nugent and Fred Kesauer.

Discharge measurements.—Made from the steel highway bridge at gage No. 1, in Hawkinsville.

Determination of discharge.—Daily discharge determined by use of Chezy formula. The coefficient, "C," is computed from each current meter measurement and is plotted on a curve showing the variation of "C" through the season. A smooth curve drawn through the plotted points shows the coefficients for intervening days. The other factors in the Chezy formula are obtained from gage height records and cross-section of the canal.

Diversions.—One spillway takes water from the Forestport feeder, just below gage No. 2, and a second spillway takes water from the basin in Boonville. Both discharge into Mill creek, which enters Black river below the Boonville gaging station. No spillway between gage No. 1 and gage No. 2. Other spillways in the feeder above gage No. 1 discharge into Black river above the gaging station. Therefore, this station indicates the total amount of water diverted past the gaging station on Black river near Boonville, and the sum of this record and the record for the Black river near Boonville indicates the total run-off of the Black river basin above these gaging stations.

Regulation.—Flow in the feeder is regulated at the outlet of Forestport reservoir.

Ice.—There is usually no flow in the canal during the winter season. Water was observed in the canal several times during the winters of 1917–1918, 1918–1919, 1919–1920 and 1920–1921, and occasional current meter measurements of the discharge were made.

Accuracy.—Records good, except when either recorder is out of commission. At such times, estimates of missing gage heights are made from gage height hydrographs or by comparison with gage heights from other recorder. Records for such periods, fair.

Coöperation.—Station maintained by the United States Geological Survey in coöperation with the State Engineer and Surveyor.

Discharge measurements of FORESTPORT FEEDER NEAR BOONVILLE, during the year ending June 30, 1921

DATE	Made by	GAGE HEIGHT		Discharge
		Gage No. 1	Gage No. 2	
		<i>Feet</i>	<i>Feet</i>	<i>Sec.-ft.</i>
July 16.....	Howe and Currier.....	2.825	1.552	205
July 26.....	S. M. Currier.....	2.805	1.530	194
Aug. 18.....	C. C. Covert.....	2.850	1.403	203
Sept. 6.....	C. C. Covert.....	2.830	1.510	196
Sept. 27.....	Lamoureux and Lauterhahn a.....	2.996	1.841	200
Nov. 16.....	Currier and Lauterhahn.....	2.443	1.284	175
Nov. 16.....	Currier and Lauterhahn.....	2.443	1.284	175
Nov. 21.....	Currier and Lauterhahn.....	2.138	1.250	141
Feb. 28.....	S. M. Currier.....	.....	.....	59.5
May 16.....	Covert and Au.....	1.735	.670	125
May 29.....	Covert and Au.....	2.555	1.345	206
June 8.....	C. C. Covert.....	2.447	1.113	195

a Measurement made at Gage No. 2.

Daily discharge, in second-feet, of FORESTPORT FEEDER NEAR BOONVILLE, for the year ending June 30, 1921

DAY	July	Aug.	Sept.	Oct.	Nov.	May	June
1.....	198	208	207	229	235	.....	216
2.....	200	198	202	189	243	.....	211
3.....	223	198	210	175	228	.....	195
4.....	213	202	202	188	212	.....	218
5.....	205	203	199	188	210	.....	209
6.....	201	203	207	184	211	.....	200
7.....	211	198	224	198	207	.....	200
8.....	198	189	224	210	205	.....	200
9.....	203	163	228	204	210	.....	197
10.....	196	160	220	202	191	.....	198
11.....	212	213	218	191	184	.....	198
12.....	202	201	212	189	194	.....	194
13.....	209	200	209	187	185	.....	213
14.....	214	207	209	189	182	.....	222
15.....	211	209	210	182	185	.....	235
16.....	206	206	209	198	179	131	229
17.....	204	197	210	194	206	147	230
18.....	201	199	210	187	211	169	221
19.....	211	209	203	191	198	223	180
20.....	201	212	207	190	188	246	175
21.....	193	210	207	183	.....	253	174
22.....	206	214	208	181	.....	249	176
23.....	204	212	205	185	.....	246	189
24.....	192	209	207	196	.....	247	210
25.....	192	204	199	192	.....	242	225
26.....	194	201	195	196	.....	248	192
27.....	198	200	197	208	.....	262	192
28.....	212	208	216	200	.....	203	194
29.....	223	210	202	206	.....	201	196
30.....	214	211	189	231	.....	163	207
31.....	207	203	.....	236	.....	170	.....

NOTE.—Discharge estimated Aug. 9, 10, Oct. 1, 2, 26-30, Nov. 9-11, 13-16, May 26-28, June 2-8, 16-18, from comparative gage-height hydrographs, study of recorder graphs, and comparison with record of Black River canal; automatic record incomplete.

Monthly discharge of FORESTPORT FEEDER NEAR BOONVILLE, for the year ending June 30, 1921

MONTH	DISCHARGE IN SECOND-FEET		
	Maximum	Minimum	Mean
July.....	223	192	205
August.....	214	160	202
September.....	228	189	208
October.....	236	175	196
November 1-20.....	243	179	203
May 16-31.....	262	131	212
June.....	235	174	203

BLACK RIVER CANAL (FLOWING SOUTH) NEAR BOONVILLE

Location.—Slope station in summit level of Black River canal, near Boonville, Oneida county.

Records available.—Occasional discharge measurements, 1900 and 1905-1915; continuous record, September 16, 1915, to June 30, 1921.

Gages.—Two Gurley 7-day graph water-stage recorders, with natural scale for gage heights; they are 1.81 miles apart. Gage No. 1 is on right bank (opposite towpath), about 50 feet downstream from collector's office in Boonville; gage No. 2 is on right bank (opposite towpath), about 300 yards above Lock 70 and 50 yards above spillway from the canal into Lansing kill. These gages and the two gages in the Forestport feeder, near Boonville, are set to the same datum. Recorders inspected by Charles Nugent and Fred Kesauer.

Discharge measurements.—Made from the steel and concrete highway bridge in the village of Boonville, a short distance below gage No. 1.

Determination of discharge.—Daily discharge determined by use of Chezy formula. The coefficient "C" is computed from each current-meter measurement and plotted on a curve showing the variation of "C" through the season. A smooth curve drawn through the plotted points shows the coefficient for intervening days. The other factors in the Chezy formula are obtained from gage height records and cross-section of canal.

Diversions.—No diversions between gage No. 1 and gage No. 2. Records obtained at this station indicate the quantity of water diverted for the canal from the Black River basin into the Mohawk River basin.

Regulation.—Flow in canal is regulated by operation of spillway and sluice gates at Lock 70, and also by discharge of Forestport feeder into the basin at Boonville.

Ice.—No flow in canal during winter season.

Accuracy.—Records good, except when either recorder is out of commission. At such times estimates of missing gage heights are made from gage-height hydrograph or by comparison with gage-height graph from other recorder. Records for such periods, fair.

Coöperation.—Station maintained by the United States Geological Survey in coöperation with the State Engineer and Surveyor.

Discharge measurements of BLACK RIVER CANAL (FLOWING SOUTH) NEAR BOONVILLE, during the year ending June 30, 1921

DATE	Made by	GAGE HEIGHT		
		Gage No. 1	Gage No. 2	Discharge
		<i>Feet</i>	<i>Feet</i>	<i>Sec.-ft.</i>
July 15.....	B. F. Howe.....	1.285	1.079	142
July 24.....	S. M. Currier.....	1.147	0.863	146
Aug. 18.....	C. C. Covert.....	0.917	0.468	138
Sept. 6.....	C. C. Covert.....	1.192	0.866	115
Sept. 27.....	Lamoureux and Lauterhahn.....	1.527	1.238	129
Oct. 21.....	V. B. Lamoureux.....	1.442	1.150	157
Nov. 15.....	Currier and Lauterhahn.....	0.697	0.531	90 3
Nov. 16.....	Currier and Lauterhahn.....	0.896	0.652	125
Nov. 21.....	Currier and Lauterhahn.....	1.291	1.032	130
May 16.....	S. M. Currier.....	0.335	0.110	111
May 29.....	Covert and Au.....	0.995	0.835	137
June 9.....	C. C. Covert.....	1.055	0.828	141

Daily discharge, in second-feet, of BLACK RIVER CANAL (FLOWING SOUTH) NEAR BOONVILLE, for the year ending June 30, 1921

DAY	July	Aug.	Sept.	Oct.	Nov.	May	June
1.....	137	146	134	140	149	.....	130
2.....	145	135	115	130	176	.....	155
3.....	132	145	118	124	151	.....	138
4.....	164	142	115	133	135	.....	160
5.....	137	143	115	126	144	.....	156
6.....	173	146	97	126	161	.....	133
7.....	154	142	92	143	154	.....	161
8.....	163	138	93	160	153	.....	139
9.....	124	120	111	158	147	.....	139
10.....	148	115	135	144	158	.....	139
11.....	146	150	122	142	155	.....	138
12.....	133	146	128	144	141	.....	131
13.....	150	137	135	142	127	.....	150
14.....	145	138	114	139	123	.....	157
15.....	141	151	130	137	125	.....	157
16.....	151	133	130	139	130	107	162
17.....	153	131	122	141	144	114	166
18.....	160	138	107	134	143	99	157
19.....	167	144	124	130	137	93	128
20.....	155	141	121	134	137	100	122

Daily discharge, in second-feet, of BLACK RIVER CANAL (FLOWING SOUTH) NEAR BOONVILLE, for the year ending June 30, 1921 — *Continued*

DAY	July	Aug.	Sept.	Oct.	Nov.	May	June
21.....	158	143	116	149	.....	110	120
22.....	150	141	110	150	.....	108	120
23.....	159	122	104	155	.....	108	139
24.....	147	137	105	168	.....	115	153
25.....	150	132	117	160	.....	116	171
26.....	152	141	123	169	.....	100	150
27.....	169	127	128	185	.....	138	149
28.....	150	127	123	180	.....	125	152
29.....	162	123	119	160	.....	126	145
30.....	148	130	134	129	.....	136	161
31.....	150	127	.....	133	.....	151	.....

NOTE.— Discharge estimated July 4, 7, 13, 23, 27, 28, Aug. 9-14, 18, 19, 22, 23, 25, 29, 30, Sept. 6-25, 28, 29, Oct. 9-21, Nov. 9, 10, 13-16, 19, 20, by comparison of gage-height hydrographs, Gages Nos. 1 and 2 and Gage No. 2, Forestport Feeder, and from study of recorder graphs; automatic record incomplete.

Monthly discharge of BLACK RIVER CANAL (FLOWING SOUTH) NEAR BOONVILLE, for the year ending June 30, 1921

MONTH	DISCHARGE IN SECOND-FEET		
	Maximum	Minimum	Mean
July.....	173	124	151
August.....	151	115	136
September.....	135	92	118
October.....	185	124	144
November 1-20.....	176	123	144
May 16-31.....	151	89	115
June.....	171	120	146

MOOSE RIVER DESCRIPTION

Moose river is tributary to Black river at Lyons Falls, joining Black river just above the head of the fall of about 50 feet. The drainage of Moose river lies chiefly in Hamilton and Herkimer counties and comprises a wild, rugged and little inhabited region, largely forest-covered, but containing also large tracts of cut and burned-over lands and numerous and extensive swamps and lakes. The stream above the gaging station near McKeever comprises three main branches. The south branch is chiefly broad and sluggish. The area tributary to this branch contains extensive swamps and marshes and but few lakes, the most important lakes being the Limekill and Little Moose lakes. The middle branch is substantially a continuous chain of lakes, known as the Fulton Chain, extending from Old Forge a distance of about 15 miles upstream through eight different lakes. The outflow from Fulton Chain is artificially controlled by a State dam at Old Forge.

The first to fourth lakes, inclusive, are at elevation 1,706 feet above tide. There is also a dam at the outlet of the sixth lake. Sixth, Seventh and Eighth lakes are at elevation 1,785 to 1,788 feet above tide. The north branch of the stream is made up of a large number of scattered lakes, the most important one being Big Moose lake.

MOOSE RIVER AT MOOSE RIVER

Location.—In the village of Moose River, Lewis county, about 3 miles down stream from McKeever, 5 miles below mouth of South branch of Moose river and nearly 20 miles above junction of Black and Moose rivers at Lyons Falls.

Drainage area.—370 square miles (measured on topographic maps).

Records available.—June 5, 1900, to June 30, 1921.

Gage.—Staff in two sections on left bank a short distance above the cable; read by W. D. Rinkle. Gage datum was lowered 0.17 foot February 28, 1903, and again 5 feet on January 1, 1913.

Discharge measurements.—Made from a cable a short distance below gage.

Channel and control.—Cobblestone and boulders; fairly permanent. Current smooth; depth comparatively uniform. Ice and logs occasionally jam above the station on a small island.

Extremes of discharge.—Maximum stage recorded during year, 12.59 feet at 9:15 A. M., March 22 (discharge, 6,290 second-feet); minimum stage recorded, 5.05 feet at 5:15 A. M., June 19 (discharge, 58 second-feet).

1900–1921: Maximum stage recorded, 16.3 feet during the afternoon of March 27, 1913, determined by leveling from flood marks (discharge, about 16,500 second-feet); minimum stage recorded, 4.94 feet, July 21, 23, 25, 26 and 27, 1913 (discharge, about 42 second-feet).

Ice.—Stage-discharge relation affected by ice.

Regulation.—A timber dam at McKeever, 3 miles up stream, is used for power and for the regulation of flow during log driving. Seasonal distribution of flow affected by operation of the State dam at Old Forge. This regulation is indicated by a record from station, "Middle Branch of Moose River at Old Forge."

Accuracy.—Stage-discharge relation practically permanent, except as affected by ice. Rating curve well defined between 100 and 5,500 second-feet. Gage read to half-tenths twice daily. Daily discharge ascertained by applying mean daily gage height to rating table. Records good, except for low stage, when mean of two daily readings of gage may not indicate the correct mean gage height owing to fluctuations in stage.

Coöperation.—Station maintained by the United States Geological Survey in coöperation with the State Engineer and Surveyor.

Discharge measurements of MOOSE RIVER AT MOOSE RIVER, during the year ending June 30, 1921

DATE	Made by	Gage height	Discharge
		<i>Feet</i>	<i>Sec.-ft.</i>
July 23.....	S. M. Currier.....	6.40	407
Oct. 13.....	Currier and Lamoureux.....	6.25	340
Oct. 13.....	Currier and Lamoureux.....	6.29	341
Jan. 29.....	Harrington and Currier.....	6.75	487
Feb. 27.....	S. M. Currier.....	6.82	135
Mar. 11.....	S. M. Currier.....	10.58	3,950
Mar. 11.....	S. M. Currier.....	10.46	3,810
Mar. 24.....	S. M. Currier.....	10.00	2,830
April 19.....	B. F. Howe.....	8.54	1,500
May 17.....	Currier and Howe.....	5.98	286

^a Backwater from ice.

Daily discharge, in second-feet, of MOOSE RIVER AT MOOSE RIVER, for the year ending June 30, 1921

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	138	289	274	670	836	422	1,020	360	659	2,760	1,590	386
2.....	146	274	320	1,140	450	1,910	540	360	650	2,660	1,260	404
3.....	114	289	274	760	580	2,060	1,750	400	800	2,090	625	320
4.....	103	295	230	289	810	2,000	1,380	380	700	1,910	1,260	259
5.....	274	304	259	580	760	1,670	1,260	420	800	1,460	860	83
6.....	202	289	202	422	1,300	2,660	1,020	85	699	1,590	670	259
7.....	386	259	230	404	131	2,270	910	360	850	1,750	670	151
8.....	460	259	216	230	760	1,590	965	400	1,590	1,520	230	244
9.....	625	289	216	202	580	1,080	128	500	4,280	1,320	560	83
10.....	441	274	216	164	580	1,200	460	420	5,680	1,380	580	202
11.....	164	289	244	336	965	1,080	760	440	3,280	1,320	404	230
12.....	138	580	259	230	910	274	860	420	2,760	760	386	202
13.....	352	810	352	352	670	625	700	280	2,660	860	386	352
14.....	352	715	460	304	216	1,140	700	480	2,860	810	386	386
15.....	460	715	320	230	625	5,320	750	380	2,490	760	304	350
16.....	670	670	244	352	460	2,960	160	340	3,740	1,320	422	320
17.....	352	580	240	117	670	2,090	950	320	3,500	2,460	289	259
18.....	146	540	230	259	441	1,590	800	420	2,960	2,860	289	289
19.....	625	560	369	114	422	1,320	600	460	2,460	2,090	289	83
20.....	965	369	352	176	460	1,140	550	380	3,500	1,450	259	259
21.....	760	336	336	289	151	1,140	480	360	6,130	1,200	304	320
22.....	560	336	230	289	460	1,020	420	500	5,960	965	93	304
23.....	460	320	289	304	580	1,020	150	500	3,280	860	460	289
24.....	386	289	216	289	860	1,140	600	480	2,860	860	259	289
25.....	176	244	259	320	760	760	440	420	3,740	965	289	274
26.....	386	202	244	202	670	1,020	800	400	5,030	965	202	114
27.....	965	202	289	202	670	965	600	130	3,620	715	460	422
28.....	289	202	320	336	189	1,080	500	650	3,860	670	289	91
29.....	289	202	336	352	422	1,020	480	.....	2,170	625	126	422
30.....	244	202	386	352	404	1,200	100	.....	3,560	580	280	460
31.....	244	230	.....	101	.....	910	480	.....	2,660	.....	441	.....

NOTE.—Discharge, January 13, March 7, determined from gage-heights corrected for ice effect from 2 discharge measurements, study of weather records and comparison with discharge data of Black River near Boonville. Discharge estimated August 4, September 17, November 2, December 4, April 14, 21, 29, May 30, June 15; no gage-height record.

Monthly discharge of MOOSE RIVER AT MOOSE RIVER, for the year ending June 30, 1921

[Drainage area, 370 square miles]

MONTH	DISCHARGE IN SECOND-FEET				RUN-OFF Depth in inches on drainage area
	Maximum	Minimum	Mean	Per square mile	
July.....	965	103	381	1.03	1.19
August.....	810	202	366	.989	1.14
September.....	460	202	278	.751	.84
October.....	1,140	101	334	.903	1.04
November.....	1,200	131	573	1.55	1.73
December.....	5,320	274	1,470	3.97	4.58
January.....	1,750	100	686	1.85	2.13
February.....	650	85	394	1.06	1.10
March.....	6,130	600	2,890	7.81	9.00
April.....	2,860	580	1,380	3.73	4.16
May.....	1,590	93	482	1.30	1.60
June.....	460	83	270	.730	.81
The year.....	6,130	83	798	2.16	29.22

MIDDLE BRANCH OF MOOSE RIVER AT OLD FORGE

Location.—About 300 feet below highway bridge and 400 feet below State dam at Old Forge, Herkimer county.

Drainage area.—51.5 square miles (measured on topographic maps).

Records available.—November 9, 1911, to June 30, 1921.

Gage.—Vertical staff on left bank, 300 feet below highway bridge; read by Joseph Otis.

Discharge measurements.—Made from highway bridge or by wading near gage.

Channel and control.—Bed near gage composed of stone and gravel. Control is rock ledge, about 200 feet below gage; practically permanent.

Extremes of discharge.—Maximum stage recorded during year, 5.1 feet, morning and evening, March 23 (discharge, 862 second-feet); minimum stage recorded, 0.90 foot at 5 P. M., November 9 and 8 A. M., November 10 and 12 (discharge, 21 second-feet).

1911-1921: Maximum open channel stage recorded, that of current year. Minimum stage recorded, 0.80 foot several times in October, 1919 (discharge, 16 second-feet).

Ice.—Stage-discharge relation not affected by ice.

Regulation.—Flow controlled by gates at dam.

Accuracy.—Stage-discharge relation practically permanent; not affected by ice. Rating curve well defined from 20 to 400 second-feet. Gage read to hundredths twice daily. Daily discharge ascertained by applying to rating table mean daily gage height weighted on days of changing gates from records of gage

opening at dam. Records good, except those computed from gate openings at the dam, which are fair.

Coöperation.—Station maintained by the United States Geological Survey in coöperation with the State Engineer and Surveyor.

Discharge measurements of MIDDLE BRANCH OF MOOSE RIVER AT OLD FORGE, during the year ending June 30, 1921

DATE	Made by	Gage height	Discharge
		<i>Feet</i>	<i>Sec.-ft. 1/100</i>
July 22.....	Currier and Howe.....	1.14	30.5
July 23.....	S. M. Currier.....	1.12	32.0
Oct. 12.....	Currier and Lamoureux.....	1.96	120
Oct. 12.....	Currier and Lamoureux.....	1.96	121
Nov. 17.....	Lauterhahn and Currier.....	1.16	37.6
Nov. 17.....	Lauterhahn and Currier.....	1.16	36.8
Jan. 28.....	Harrington and Currier.....	1.47	64.7
May 18.....	Currier and Howe.....	1.29	44.0
May 18.....	Currier and Howe.....	1.29	44.8

Daily discharge, in second-feet, of MIDDLE BRANCH OF MOOSE RIVER AT OLD FORGE, for the year ending June 30, 1921

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	28	60	65	98	34	32	110	40	104	557	70	46
2.....	28	65	65	42	36	34	110	39	104	530	75	46
3.....	28	80	70	39	46	35	110	39	116	530	75	47
4.....	32	105	70	42	41	38	110	39	123	477	75	46
5.....	49	105	65	26	32	40	110	39	116	451	75	46
6.....	45	105	65	31	25	48	110	70	123	311	75	43
7.....	38	131	65	26	26	49	110	110	123	280	75	45
8.....	51	132	65	46	25	50	92	110	123	270	75	43
9.....	47	132	65	25	22	49	80	110	158	270	61	42
10.....	29	132	65	110	22	48	80	110	136	173	46	45
11.....	29	139	64	116	22	47	92	110	223	70	46	51
12.....	29	170	158	123	22	46	92	110	280	70	45	46
13.....	35	194	158	116	22	45	92	110	270	75	43	50
14.....	39	194	116	123	36	46	92	110	270	70	42	48
15.....	31	186	86	116	39	55	75	104	280	70	41	50
16.....	35	187	86	116	35	75	64	104	290	70	42	49
17.....	34	187	110	110	36	123	65	104	311	75	46	45
18.....	32	179	158	116	37	136	65	98	355	80	45	46
19.....	36	110	173	110	38	123	63	98	355	86	44	46
20.....	39	110	150	110	36	110	63	98	378	98	43	45
21.....	39	104	130	110	38	104	65	104	477	86	43	46
22.....	33	104	136	110	38	110	65	104	702	86	45	47
23.....	31	98	130	110	35	136	65	110	862	75	47	47
24.....	35	75	130	110	34	104	65	110	829	75	42	46
25.....	34	75	123	86	33	116	65	104	796	75	45	46
26.....	32	75	123	53	33	104	65	110	764	75	46	47
27.....	31	70	123	50	32	116	63	110	733	75	48	45
28.....	60	65	123	53	32	116	63	110	702	75	46	45
29.....	60	65	123	54	32	116	63	....	672	70	44	52
30.....	60	65	123	43	32	116	62	....	613	80	45	50
31.....	60	65	....	36	....	110	50	....	585	....	44	....

NOTE.— Discharge, July 1, August 18 and May 9, June 30, determined by indirect method on account of backwater, on basis of 4 discharge measurements.

Monthly discharge of MIDDLE BRANCH OF MOOSE RIVER AT OLD FORGE, for the
year ending June 30, 1921
[Drainage area, 51.5 square miles]

MONTH	DISCHARGE IN SECOND-FEET				RUN-OFF
	Maximum	Minimum	Mean	Per square mile	Depth in inches on drainage area
July	60	28	38.3	.744	.86
August	194	60	115	2.23	2.57
September	173	64	106	2.06	2.30
October	123	25	79.2	1.54	1.78
November	46	22	32.4	.629	.70
December	136	32	79.9	1.55	1.79
January	110	50	79.9	1.55	1.79
February	110	39	93.4	1.81	1.88
March	862	104	266	7.50	8.65
April	557	70	180	3.50	3.90
May	75	41	527	1.02	1.19
June	52	42	465	.903	1.01
The year	862	22	108	2.10	28.42

BEAVER RIVER

Beaver river drains a mountainous region in the northern part of Herkimer county; it flows in a westerly direction and enters Black river about midway between Lowville and Carthage. This river is about 60 miles long and has a total fall of about 1,200 feet. A State dam near Beaver river impounds 900,000,000 cubic feet.

BEAVER RIVER AT STATE DAM NEAR BEAVER RIVER

Location.—At concrete storage dam at outlet of Beaver river flow, about $7\frac{1}{2}$ miles west of Beaver River post-office, Herkimer county, and 7 miles above Beaver lake at Number Four.

Drainage area.—176 square miles (measured on topographic maps).

Records available.—May 11, 1908, to June 30, 1921.

Gages.—Elevation of water surface in the reservoir is determined by a staff gage in two sections, on the west corner of the gate house; read by James Dunbar, gate tender. The mean elevation of the crest of the spillway is at gage height 16.96 feet. Width of sluice gate openings determined by measuring on the gate stems the distance they have been raised.

Discharge measurements.—Current-meter measurements made from a temporary footbridge at the mouth of the outlet tunnel, below the gates. Discharge over the spillway has not been measured.

Determination of discharge.—Records include the discharge through one or more of four 4-foot circular sluice gates, when

opened, the discharge over the spillway, and the discharge through the logway at the west end of the spillway. The sluice gates have been rated by current-meter measurements made at different lake elevations, but no measurements have been made of the discharge over the spillway or through the logway. Theoretic coefficients based on the Cornell experiments* have been used to compute ratings for the spillway and logway.

Regulation.—At ordinary stages the discharge of Beaver river is completely regulated by the operation of the sluice gates.

Extremes of stage.—Maximum elevation of water surface in reservoir recorded during year, 19.0 feet at 8:40 A. M., March 21 and 7 A. M., March 22; minimum elevation recorded, 7.65 feet at 5:30 P. M., November 1.

1908–1921: Maximum elevation of water surface in reservoir, 19.46 feet, March 29, 1913; minimum elevation, 2.9 feet, September 29, and October 1, 1913.

Extremes of discharge.—Maximum daily discharge during year, 2,600 second-feet, March 22; minimum discharge, zero, several days in July and October, when gates were closed.

1908–1921: Maximum discharge, 3,296 second-feet on May 2, 1911; minimum discharge, zero, during periods when gates were closed and there was no flow over spillway.

Accuracy.—Stage-discharge relation permanent; probably not affected by ice. Rating curves for sluice gates well defined. Lake gage read to half-tenths once daily. The accuracy of computations depends to a large extent on the care with which the gates were set to the recorded openings. Records, fair.

Coöperation.—Station maintained by the United States Geological Survey in coöperation with the State Engineer and Surveyor.

No discharge measurements were made during the year.

Daily discharge, in second-feet, of BEAVER RIVER AT STATE DAM NEAR BEAVER RIVER, for the year ending June 30, 1921

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.	234	250	300	212	312	159	99	340	316	1,540	289	178
2.	234	250	300	215	314	161	100	337	316	1,470	320	177
3.	233	249	299	64	254	111	141	335	316	1,040	320	177
4.	233	249	299	0	250	86	181	333	317	924	320	177
5.	233	248	297	166	257	88	182	330	316	796	319	176
6.	136	248	295	221	173	93	218	329	316	697	316	174
7.	0	247	293	327	137	131	261	328	317	649	269	173
8.	0	247	293	385	138	183	261	328	317	649	253	172
9.	0	246	291	302	139	184	284	328	321	601	219	172
10.	0	245	289	219	141	244	330	327	1,040	601	187	172

*United States Geological Survey Water-Supply Paper 200.

Daily discharge, in second-feet, of BEAVER RIVER AT STATE DAM NEAR BEAVER RIVER, for the year ending June 30, 1921 — *Continued*

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
11.....	0	245	288	219	142	362	330	325	1,530	555	187	172
12.....	127	245	288	218	143	362	263	324	1,530	511	187	172
13.....	217	245	287	217	144	362	198	324	1,470	511	186	172
14.....	217	244	161	217	145	515	185	322	1,410	422	186	172
15.....	217	244	18	217	146	624	198	321	1,360	304	186	138
16.....	217	244	18	257	146	750	228	321	1,470	143	185	44
17.....	216	221	121	281	147	874	240	320	1,660	274	185	172
18.....	216	152	302	279	148	874	225	320	1,790	275	184	172
19.....	217	151	220	278	148	874	225	320	1,660	278	184	172
20.....	83	151	219	277	149	872	212	320	1,260	279	183	172
21.....	0	205	218	275	149	867	212	320	2,500	280	183	171
22.....	378	243	217	273	150	865	288	320	2,600	301	182	295
23.....	427	242	217	300	150	861	288	320	2,440	359	182	242
24.....	0	241	215	367	151	752	253	318	1,790	309	180	195
25.....	0	240	215	359	152	608	217	318	2,060	280	180	195
26.....	137	240	286	352	153	437	182	317	2,060	280	179	194
27.....	252	239	258	345	154	97	179	317	2,010	280	179	195
28.....	252	276	213	337	155	97	130	316	1,910	249	179	195
29.....	252	302	213	329	155	97	101	.....	1,810	237	178	195
30.....	251	300	213	324	156	98	104	.....	1,670	238	178	195
31.....	251	300	.....	314	.....	98	207	.....	1,410	.....	178	.....

Monthly discharge of BEAVER RIVER AT STATE DAM NEAR BEAVER RIVER, for the year ending June 30, 1921
[Drainage area, 176 square miles]

MONTH	DISCHARGE IN SECOND-FEET				RUN-OFF Depth in inches on drainage area
	Maximum	Minimum	Mean	Per square mile	
July.....	427	0	169	0.960	1.11
August.....	302	151	240	1.36	1.57
September.....	302	18	238	1.35	1.51
October.....	385	0	263	1.49	1.72
November.....	314	137	170	.966	1.08
December.....	874	86	412	2.34	2.70
January.....	330	99	210	1.19	1.37
February.....	340	316	324	1.84	1.92
March.....	2,600	316	1,330	7.56	8.72
April.....	1,540	143	511	2.90	3.24
May.....	320	178	214	1.22	1.41
June.....	295	44	179	1.02	1.14
The year.....	2,600	0	356	2.02	27.49

NOTE.— The above figures do not necessarily represent the natural flow of the river, on account of regulation at the dam.

ST. LAWRENCE RIVER DRAINAGE BELOW LAKE ONTARIO OSWEGATCHIE RIVER DESCRIPTION

Oswegatchie river rises in Cranberry lake and the mountains to the southwest in St. Lawrence and Jefferson counties, whence it flows in a general northerly direction into the St. Lawrence river at Ogdensburg, where its drainage area is 1,609 square miles. The river is formed by the junction of the east branch of Oswegatchie river and the west branch of the Oswegatchie river at Talleville and its main tributary below this point is Indian river, which flows through Black lake. Considerable power is developed along all three of these main tributaries and many of the power sites in the lower reaches of the river have also been developed.

EAST BRANCH OF OSWEGATCHIE RIVER AT NEWTON FALLS

Location.—600 feet below lower dam of Newton Falls Paper Company, in Newton Falls, St. Lawrence county, 4 miles above mouth of Little river and 10 miles below outlet of Cranberry lake.

Drainage area.—166 square miles (measured by engineers of State Conservation Commission).

Records available.—October 6, 1912, to June 30, 1921.

Gage.—Vertical staff on left bank, 600 feet above lower dam; read by Henry Van Waldick. Datum lowered 1 foot on July 28, 1920.

Discharge measurements.—Made by wading, or from cable 30 feet up stream from gage.

Channel and control.—Small boulders and rock; covered with waste from pulp mill; practically permanent.

Extremes of discharge.—Maximum stage recorded during year, 6.7 feet, morning and evening, March 24, and 5:25 p. m., March 25 (discharge, 1,930 second-feet); minimum stage is reached nearly every Sunday during low-water period when paper mill is shut down.

1912-1921: Maximum stage recorded, 6.1 feet at 5:15 p. m., March 28, 1913 (discharge, 2,200 second-feet).

Ice.—Stage-discharge relation affected by ice only for a short time during extremely cold weather.

Regulation.—Some diurnal fluctuation in flow caused by operation of paper mills. Seasonal flow largely controlled by storage at Cranberry lake.

Accuracy.—Stage-discharge relation practically permanent; not affected by ice during year. Rating curve well defined

between 20 and 1,200 second-feet. Gage read to hundredths twice daily. Daily discharge ascertained by applying mean daily gage height to the rating table. Records only fair, as mean daily gage heights are obtained from only two readings and may be considerably in error on account of artificial regulation.

Coöperation.—Station maintained by the United States Geological Survey in coöperation with the State Engineer and Surveyor.

Discharge measurements of EAST BRANCH OF OSWEGATCHIE RIVER AT NEWTON FALLS, during the year ending June 30, 1921

DATE	Made by	Gage height	Discharge
July 28.....	B. F. Howe.....	Feet 1.99	Sec.-ft. 334
Sept. 29.....	Currier and Covert.....	2.08	322

Daily discharge, in second-feet, of EAST BRANCH OF OSWEGATCHIE RIVER AT NEWTON FALLS, for the year ending June 30, 1921

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	282	110	232	363	205	282	242	326	363	1,500	198	293
2.....	242	232	262	363	272	293	149	430	386	1,830	380	198
3.....	282	304	232	315	205	252	223	304	363	1,270	326	214
4.....	252	171	272	326	252	272	262	826	263	1,270	474	232
5.....	293	171	198	338	252	70	252	315	338	1,120	430	214
6.....	338	272	315	293	272	214	282	315	338	894	363	174
7.....	326	262	304	293	198	445	252	315	389	571	326	252
8.....	338	163	272	338	205	304	205	326	389	460	222	232
9.....	363	163	232	363	272	293	191	315	666	538	315	252
10.....	315	214	143	282	232	293	205	326	588	416	205	242
11.....	50	376	293	214	232	198	214	345	416	430	282	242
12.....	326	171	242	363	242	129	214	338	338	490	363	205
13.....	304	315	363	252	232	149	214	272	293	475	242	205
14.....	272	363	174	304	0	191	191	338	315	445	242	232
15.....	282	205	315	304	242	430	214	268	389	499	149	272
16.....	315	293	815	338	165	430	158	326	326	506	198	252
17.....	252	315	363	143	282	416	232	338	894	430	262	232
18.....	232	304	262	252	252	252	223	380	962	863	298	262
19.....	80	293	223	272	242	102	430	326	1,270	304	326	181
20.....	315	272	272	272	282	242	304	165	1,270	400	282	198
21.....	389	232	315	293	181	272	338	338	1,500	475	272	232
22.....	338	133	894	326	293	242	376	242	1,270	445	191	198
23.....	315	252	315	165	292	252	252	149	1,170	506	174	232
24.....	315	304	214	0	282	242	293	143	1,939	350	293	262
25.....	262	262	272	205	214	165	191	149	1,860	350	282	262
26.....	80	232	272	338	252	165	198	165	1,860	315	272	143
27.....	262	232	293	232	293	232	385	143	1,740	295	272	242
28.....	214	252	242	205	70	149	214	376	1,680	430	232	262
29.....	232	205	282	242	315	148	148	.....	1,620	272	252	242
30.....	293	214	282	205	242	143	158	.....	1,620	326	214	242
31.....	350	223	.....	149	.....	158	490	.....	1,500	.....	223	.....

NOTE.—Discharge for following days estimated by comparison with records for West Branch at Harrisville and Oswegatchie near Heuvelton: July 11, 19, 26, August 1; mean daily discharge October 24 and November 14 uncertain on account of insufficient gage-height data.

Monthly discharge of EAST BRANCH OF OSWEGATCHIE RIVER AT NEWTON FALLS,
for the year ending June 30, 1921
[Drainage area, 166 square miles]

MONTH	DISCHARGE IN SECOND-FEET				RUN-OFF
	Maximum	Minimum	Mean	Per square mile	Depth in inches on drainage area
July.....	389	.....	274	1.65	1.90
August.....	376	.....	242	1.44	1.48
September.....	363	143	269	1.62	1.81
October.....	363	0	269	1.62	1.87
November.....	315	0	231	1.39	1.55
December.....	445	70	299	1.44	1.68
January.....	490	143	247	1.49	1.72
February.....	430	143	290	1.75	1.82
March.....	1,930	298	915	5.51	6.35
April.....	1,500	205	581	3.50	3.90
May.....	475	149	277	1.67	1.92
June.....	293	143	230	1.39	1.55
The year.....	1,930	0	339	2.04	27.73

NOTE.—Table shows run-off as regulated at Cranberry Lake, and by paper mills at Newton Falls.

OSWEGATCHIE RIVER NEAR HEUVELTON

Location.—2½ miles above Heuvelton, St. Lawrence county, 3 miles below Rensselaer Falls, and 7 miles above mouth of Indian river (outlet to Black lake).

Drainage area.—961 square miles (measured on topographic maps).

Records available.—June 23, 1916, to June 30, 1921.

Gage.—Gurley 7-day graph water-stage recorder on the right bank, installed September 16, 1916. Prior to this date gage-height was determined by measuring the distance from a reference point to the water surface. Recorder inspected by George Todd.

Discharge measurements.—Made from cable 50 feet below gage, or by wading.

Channel and control.—Solid rock.

Extremes of discharge.—Maximum stage during the year from water-stage recorder, 6.8 feet at 6 P. M., December 16 (discharge, 9,700 second-feet); minimum stage from water-stage recorder, 0.98 feet at 2 P. M., June 30 (discharge, 355 second-feet).

1916–1921: Maximum stage from water-stage recorder, 7.6 feet from 9 to 12 A. M., March 30, 1917 (discharge, 11,700 second-feet); minimum stage from water-stage recorder, 0.91 foot at 11 P. M., October 16, 1916 (discharge, 320 second-feet).

Ice.—Stage-discharge relation slightly affected by ice.

Regulation.—Some diurnal fluctuation, due to operation of mills at Rensselaer Falls and above. Seasonal flow regulated by storage in Cranberry lake.

Accuracy.—Stage-discharge relation permanent, except as affected by ice. Rating curve well defined between 400 and

15,000 second-feet. Operation of water-stage recorder satisfactory during the year. Daily discharge ascertained by applying to rating table mean daily gage height determined by inspection of recorder graph, or for days of considerable variation in stage, by averaging discharge for intervals of the day. Open-water records, good; winter records, fair.

Coöperation.—Station maintained by the United States Geological Survey in coöperation with the State Engineer and Surveyor.

Discharge measurements of OSWEGATCHIE RIVER NEAR HEUVELTON, during the year ending June 30, 1921

DATE	Made by	Gage height	Discharge
July 29.....	S. M. Currier.....	Feet 1.52	Sec.-ft. 725
Jan. 24.....	S. M. Currier.....	2.38	1,710

Daily discharge, in second-feet, of OSWEGATCHIE RIVER NEAR HEUVELTON, for the year ending June 30, 1921

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	520	608	459	1,040	630	1,580	1,900	854	1,380	5,670	1,220	1,150
2.....	499	678	513	1,780	719	1,980	2,600	827	2,060	5,670	1,340	1,200
3.....	513	678	570	1,980	938	2,750	4,000	827	3,780	5,480	1,430	1,040
4.....	592	622	764	1,840	1,530	2,820	3,800	791	3,870	4,830	1,460	900
5.....	854	592	719	1,590	1,650	3,130	3,400	782	3,370	4,210	1,320	764
6.....	1,240	585	630	1,400	1,630	4,740	3,200	791	2,980	3,620	1,190	670
7.....	1,540	548	600	1,220	1,430	5,480	2,600	800	3,530	2,980	1,090	608
8.....	1,470	570	548	1,030	1,260	5,480	2,200	809	4,210	2,390	985	570
9.....	1,330	555	499	938	1,120	5,100	2,000	836	5,480	2,110	909	520
10.....	1,370	513	520	872	1,000	4,120	1,700	836	6,650	1,980	909	508
11.....	1,300	499	499	791	918	3,370	1,500	818	8,540	1,910	918	541
12.....	1,110	452	513	710	976	3,050	1,300	827	9,220	1,910	800	541
13.....	890	466	608	678	1,010	2,600	1,200	818	8,100	1,770	800	527
14.....	872	520	670	630	985	3,400	1,100	782	6,650	1,610	845	492
15.....	890	472	854	615	909	7,680	1,000	764	5,100	1,510	737	578
16.....	827	478	1,030	622	818	9,700	1,000	916	4,470	1,420	622	662
17.....	890	485	918	654	755	9,220	1,000	2,720	4,560	1,540	608	686
18.....	782	513	782	638	773	7,680	950	3,290	4,650	2,040	570	670
19.....	827	485	678	615	909	6,250	900	2,390	4,650	2,110	578	600
20.....	1,480	485	600	622	1,340	4,830	800	1,480	4,740	2,180	600	534
21.....	1,780	466	570	622	1,430	3,370	850	1,240	5,480	2,110	600	472
22.....	1,650	440	585	592	1,320	3,200	1,500	1,240	6,250	2,040	654	472
23.....	1,300	433	555	555	1,280	3,200	1,700	1,240	6,650	1,980	541	414
24.....	1,120	420	513	492	1,340	3,600	1,600	1,220	7,050	2,180	562	409
25.....	1,090	459	499	452	2,180	3,800	1,400	1,120	7,260	2,180	548	426
26.....	1,020	472	527	426	2,530	3,600	1,300	1,020	7,050	1,910	492	394
27.....	938	459	499	452	2,530	3,400	1,140	966	6,250	1,590	499	387
28.....	818	440	513	478	2,320	3,000	1,010	956	5,860	1,420	570	398
29.....	719	433	592	478	2,180	2,800	985	.....	5,860	1,220	570	409
30.....	654	420	622	555	1,770	2,400	947	.....	6,050	1,290	548	378
31.....	608	394	.....	630	.....	2,200	938	.....	5,860	.....	728	.....

NOTE.—Discharge, December 22 to January 26, determined from gage-heights corrected for ice effect from one discharge measurement, study of automatic record and comparison with other stations. Discharge partially estimated from recorder graph October 10, 17, 31, November 21, February 6 to 8, 20 to 22, April 17, 18, May 8, June 5, 19, 26, 27, automatic record incomplete.

Monthly discharge of OSWEGATCHIE RIVER NEAR HBUVELTON, for the year ending
June 30, 1921

[Drainage area, 961 square miles]

MONTH	DISCHARGE IN SECOND-FEET				RUN-OFF
	Maximum	Minimum	Mean	Per square mile	Depth in inches on drainage area
July	1,780	499	1,020	1.06	1.22
August	678	394	505	.525	.61
September	1,030	459	615	.640	.71
October	1,980	428	839	.873	1.01
November	2,530	630	1,340	1.39	1.55
December	9,700	1,580	4,180	4.35	5.02
January	4,000	800	1,660	1.73	1.99
February	3,290	764	1,140	1.19	1.24
March	9,220	1,380	5,410	5.63	6.49
April	5,670	1,220	2,600	2.60	2.90
May	1,460	492	814	.847	.98
June	1,200	376	597	.621	.69
The year	9,700	376	1,730	1.80	24.41

WEST BRANCH OF OSWEGATCHIE RIVER NEAR HARRISVILLE

Location.—At highway bridge, near Geers Corners, $2\frac{1}{2}$ miles down stream from Harrisville, Lewis county.

Drainage area.—245 square miles (measured on topographic maps and map of New York issued by United States Geological Survey; scale, 1:500,000).

Records available.—July 1, 1916, to June 30, 1921.

Gage.—Vertical staff in three sections on the right bank; section graduated from 0.0 to 3.3 feet, about 25 feet below bridge, and two sections graduated from 3.3 to 10.1 feet on downstream side of bridge abutment. Read by Frank Osborne.

Discharge measurements.—Made from cable 200 feet up stream from bridge, or by wading.

Channel and control.—Rocky and rough; probably permanent.

Extremes of discharge.—Maximum stage recorded during year, 7.9 feet at 5 P. M., March 22 (discharge, 4,580 second-feet); minimum stage recorded, 1.25 feet at 7 A. M., August 30 (discharge, 54 second-feet).

1916–1921: Maximum stage recorded, 8.1 feet at 6:30 A. M. and 6 P. M., March 28, 1917 (discharge, 4,880 second-feet); minimum stage recorded, 1.1 feet at 6 P. M., August 11, 1917, and 7 A. M., August 28 and 29, 1918 (discharge, 42 second-feet).

Ice.—Stage-discharge relation only slightly affected by ice during extremely cold periods.

Regulation.—Operation of pulp mill at Harrisville causes some diurnal fluctuation.

Accuracy.—Stage-discharge relation practically permanent; only slightly affected by ice for short periods. Rating curve well defined between 50 and 4,000 second-feet. Gage read to half-tenths twice daily. Daily discharge ascertained by applying mean daily gage height to rating table. Records good, except those for low stages, which may be subject to error, owing to diurnal fluctuation.

Coöperation.—Station maintained by the United States Geological Survey in coöperation with the State Engineer and Surveyor.

The following discharge measurement was made by S. M. Currier: July 27, gage height, 2.40 feet; discharge, 275 second-feet..

Daily discharge, in second-feet, of WEST BRANCH OF OSWEGATCHIE RIVER NEAR HARRISVILLE, for the year ending June 30, 1921

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	106	245	245	320	182	440	750	275	480	1,490	460	520
2.....	98	232	335	600	335	650	1,100	226	526	1,490	480	358
3.....	146	220	245	650	480	800	1,100	220	750	1,420	480	290
4.....	560	170	195	422	650	970	1,000	195	970	1,210	388	232
5.....	700	182	170	335	600	1,090	900	220	910	970	335	182
6.....	650	146	275	275	560	1,490	800	220	700	850	305	195
7.....	560	124	220	208	460	2,130	700	220	1,080	750	245	170
8.....	560	124	182	195	388	1,880	600	245	1,490	650	275	146
9.....	560	91	146	182	370	1,560	480	232	3,080	560	232	98
10.....	480	115	115	98	370	1,280	440	195	4,220	700	245	106
11.....	405	135	91	146	370	1,030	380	220	3,880	650	220	106
12.....	275	115	91	124	335	850	340	220	2,990	560	232	170
13.....	320	115	106	160	305	700	300	208	2,220	490	220	335
14.....	320	98	245	79	275	800	280	208	1,880	440	208	335
15.....	335	124	245	91	275	2,130	280	220	1,640	440	195	260
16.....	290	98	220	91	245	2,490	280	232	1,640	440	195	220
17.....	220	91	220	91	305	1,880	280	560	2,040	560	195	208
18.....	275	124	170	98	440	1,640	280	560	1,960	800	170	170
19.....	560	85	182	91	520	1,350	280	560	1,490	910	146	146
20.....	850	79	124	79	480	1,030	280	520	1,720	910	146	124
21.....	850	91	115	85	405	750	300	440	2,990	750	146	115
22.....	660	85	106	79	440	700	340	405	4,460	750	146	85
23.....	440	91	91	79	560	850	320	352	3,860	750	124	85
24.....	405	79	91	79	1,090	1,090	380	335	2,490	700	146	85
25.....	370	74	91	70	1,090	1,000	300	305	1,800	700	146	74
26.....	405	74	79	74	1,030	900	280	305	1,490	560	170	106
27.....	388	74	85	77	850	800	280	305	1,420	480	170	91
28.....	245	74	124	124	750	750	275	305	1,490	440	146	115
29.....	208	77	146	182	560	700	275	.....	1,640	370	195	106
30.....	245	60	146	170	460	600	232	.....	1,640	370	480	91
31.....	305	91	.....	124	.....	600	245	.....	1,490	.....	700	.....

NOTE.—Discharge, December 25–January 27, estimated on account of probable ice effect, from study of gage-heights and weather records.

Monthly discharge of WEST BRANCH OF OSWEGATCHIE RIVER NEAR HARRISVILLE,
for the year ending June 30, 1921
[Drainage area, 245 square miles]

MONTH	DISCHARGE IN SECOND-FEET				RUN-OFF
	Maximum	Minimum	Mean	Per square mile	Depth in inches on drainage area
July.....	850	98	412	1.68	1.94
August.....	245	60	116	.473	.55
September.....	335	79	168	.665	.74
October.....	650	70	175	.715	.82
November.....	1,069	182	506	2.06	2.30
December.....	2,490	440	1,130	4.61	5.32
January.....	1,180	232	454	1.85	2.13
February.....	560	195	304	1.24	1.29
March.....	4,460	460	1,850	7.96	9.18
April.....	1,490	370	738	3.01	3.36
May.....	700	124	256	1.04	1.20
June.....	520	74	178	.727	.81
The year.....	4,460	60	535	2.18	29.64

RAQUETTE RIVER DESCRIPTION

Raquette river rises in northern Hamilton county, flows almost north through a long narrow valley to St. Lawrence river. Its total length from its source to its confluence with the St. Lawrence, near the most northern point of the state, is 162 miles. The drainage area at the mouth of the river is 1,269 square miles.

Its source is on an elevated plateau about 1,600 feet above sea-level. The upper part of the basin includes many acres of swamp land, as well as a large area of lakes and ponds, including Tupper lake, Little Tupper lake, Long lake, Round lake, Blue Mountain lake, Forked lake and Raquette lake.

The high region receives a heavy rainfall, the mean annual amounting to about 48 inches, or about 10 inches above the mean for the state.

The course of the river through the mountains is marked by many falls and rapids, but as yet only 400 feet of the 1,400 feet of fall in the river below Tupper lake has been developed. The river is characterized by tremendous fluctuations between the maximum and minimum flow and is in great need of artificial regulation, if the possibilities of power development are to be fully realized.

RAQUETTE RIVER AT PIERCEFIELD

Location.—Half a mile below dam of International Paper Co. at Piercefield, St. Lawrence county, and about three-fourths mile above head of Black rapids.

Drainage area.—723 square miles (all but 16 square miles measured on topographic maps).

Records available.—August 20, 1908, to June 30, 1921.

Gage.—Stevens water-stage recorder installed October 22, 1912, in a galvanized sheet-iron house over a concrete well on left bank about one-half mile below dam. Recorder inspected by employee of International Paper Co.

Discharge measurements.—Made from a cable three-fourths mile below gage, just above Black rapids.

Channel and control.—Channel opposite gage is a deep pond with no perceptible velocity. Control is at head of Black rapids.

Ice.—Rapids that form control rarely freeze, measurements made when the pond was covered with ice indicate that the stage-discharge relation was not affected.

Regulation.—Large diurnal fluctuation in flow caused by operation of dam during low and medium stages. Numerous lakes in upper part of drainage basin afford considerable storage, most of which is so controlled that the effect on the seasonal distribution of flow is large.

Accuracy.—Stage discharge relation practically permanent except as affected by logs on control April to June. Rating curve well defined between 50 and 7,000 second-feet. Operation of water-stage recorder generally satisfactory.

Coöperation.—Water stage recorder inspected by an employee of the International Paper Co. Station established and maintained by United States Geological Survey in coöperation with the State Engineer and Surveyor.

Estimates of discharge for the current year are withheld from publication pending further data on 1921 rating.

The following discharge measurement was made by B. F. Howe August 16, 1920: Gage-height, 4.60 feet; discharge, 699 second-feet.

ST. REGIS RIVER

DESCRIPTION

St. Regis river has its source in several small streams and lakes in the western part of Franklin county at an elevation of about 1,500 feet above the sea. It first flows in a northwesterly direction for about 40 miles and then somewhat east of north for about 28 miles to its mouth, in the St. Lawrence river near the state line. Its drainage area comprises 664 square miles (State Water Supply Commission).

The upper portion of its watershed consists of swamp and of mountains, from which most of the forest has been cut. Upon

leaving the plateau the stream descends for 10 or 15 miles through a rugged country by a succession of steep rapids and precipitous falls to the lowlands bordering the St. Lawrence. Only a few of the excellent opportunities for developing power in the descent have as yet been utilized. From the foot of the hills to the St. Lawrence, the slope of the river is moderate and rock outcrop not frequent, consequently favorable sites for power-plants are scarce.

ST. REGIS RIVER AT BRASHER CENTER

Location.—Near steel highway bridge in Brasher Center, St. Lawrence county, 5 miles downstream from Brasher Falls, $6\frac{1}{4}$ miles below junction of east and west branches of St. Regis river and about 12 miles above mouth.

Drainage area.—621 square miles (measured on Port Route map).

Records available.—August 22, 1910, to June 30, 1921.

Gages.—Gurley seven-day graph water-stage recorder installed August 14, 1920, on left bank about 600 feet above bridge. Datum same as that of staff gage with inclined and vertical sections used June 24, 1916, to August 14, 1920. A chain gage on downstream side of bridge, at independent datum was used August 22, 1910, to June 23, 1916. Gage read by Robert Berry and Henry Shattuck.

Discharge measurements.—Made from a cable at the staff gage, installed in June, 1916. Previously made from the highway bridge, or by wading.

Channel and control.—Bed at cable composed of small boulders and coarse gravel; fairly permanent.

Extremes of discharge.—Maximum stage recorded during year, 10.17 feet at 2 A. M. March 10 (discharge, 7,460 second-feet); minimum stage recorded, 5.86 feet at 11 P. M. August 28 and 30 (discharge, 197 second-feet).

1910–1921: Maximum stage recorded, 9.1 feet at 7 A. M. March 27, 1914 (discharge, 16,200 second-feet); minimum stage recorded, 5.25 feet at 5 P. M. August 8, 1917 (discharge, about 34 second-feet).

Ice.—Stage-discharge relation affected by ice.

Accuracy.—Stage-discharge relation practically permanent, except as affected by ice December to March. Rating curve well defined between 200 and 6,000 second-feet. Gage read to quarter-tenths twice daily. Since August 14, continuous record from recording gage. Daily discharge, except for period of ice effect, ascertained by applying mean daily gage height to rating table. Open-water records good; winter records fair.

Coöperation.—Station maintained by the United States Geological Survey in coöperation with the State Engineer and Surveyor.

Discharge measurements of ST. REGIS RIVER AT BRASHER CENTER, during the year ending June 30, 1921

DATE	Made by	Gage height	Discharge
		<i>Feet</i>	<i>Sec.-ft.</i>
Aug. 11.....	S. M. Currier.....	6.08	314
Jan. 23.....	Currier and Harrington.....	a 7.31	1,340
Feb. 25.....	S. M. Currier.....	a 6.40	327

a Backwater from ice.

Daily discharge, in second-feet, of ST. REGIS RIVER AT BRASHER CENTER, for the year ending June 30, 1921

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	695	576	284	1,580	548	655	1,300	420	600	2,920	990	735
2.....	758	586	438	2,100	745	1,000	3,000	480	650	2,660	978	665
3.....	950	520	474	1,960	1,080	1,320	2,600	500	1,700	2,260	1,060	510
4.....	1,310	465	404	1,480	1,420	1,660	2,000	500	900	2,100	954	685
5.....	1,880	372	348	1,120	1,440	1,900	1,800	600	650	1,700	705	483
6.....	2,180	364	312	942	1,150	2,260	1,500	600	1,290	1,580	645	420
7.....	1,800	348	305	810	822	2,180	1,300	600	2,000	1,480	645	474
8.....	1,380	340	319	735	705	1,970	1,300	600	2,006	1,556	705	312
9.....	1,120	340	305	587	675	1,799	1,100	600	5,000	1,490	420	305
10.....	870	340	319	501	858	1,700	900	600	6,310	1,520	648	404
11.....	695	312	312	465	918	1,700	890	600	4,860	1,550	388	340
12.....	645	372	319	429	894	1,600	650	600	3,920	1,420	715	348
13.....	596	465	427	404	755	1,700	600	550	3,620	1,180	447	653
14.....	548	429	1,310	396	655	2,400	600	550	2,080	990	447	1,080
15.....	548	429	1,520	420	596	5,000	600	500	2,830	1,060	438	1,030
16.....	501	483	1,230	396	548	3,800	600	700	3,720	1,060	438	894
17.....	548	438	954	488	483	3,000	650	3,000	3,820	1,180	498	695
18.....	645	429	726	372	881	2,600	650	850	3,440	1,180	412	605
19.....	890	404	655	364	799	2,200	650	750	2,890	1,580	372	501
20.....	1,880	340	768	364	766	1,600	650	700	3,350	1,520	380	356
21.....	2,030	305	747	312	1,780	1,700	950	600	4,440	1,520	380	348
22.....	1,520	277	635	326	966	2,600	1,500	550	5,400	1,650	364	312
23.....	990	264	538	340	675	2,600	1,400	490	4,640	1,760	356	277
24.....	819	270	474	340	510	2,800	1,000	380	3,620	1,590	348	259
25.....	758	259	420	356	665	2,800	600	320	3,170	1,690	340	259
26.....	685	254	356	356	715	2,600	550	320	3,080	1,460	364	248
27.....	615	248	340	404	755	2,280	550	280	3,000	1,250	356	242
28.....	758	242	396	483	715	2,000	550	320	3,170	1,210	348	259
29.....	615	226	466	528	685	1,700	600	.....	3,080	1,040	348	248
30.....	548	220	492	510	665	1,500	600	.....	2,660	990	483	259
31.....	492	237	.....	492	.....	1,300	420	.....	2,660	.....	665	.....

NOTE.—Discharge, December 10–March 9, determined from gage-heights corrected for ice effect from 2 discharge measurements, study of weather records and comparison with records in adjacent drainage areas. No gage-height record February 19–24. Discharge estimated August 8 and 9; no gage-height record.

Monthly discharge of ST. REGIS RIVER AT BRASHER CENTER, for the year ending
June 30, 1921

[Drainage area, 621 square miles]

MONTH	DISCHARGE IN SECOND-FEET				RUN-OFF
	Maximum	Minimum	Mean	Per square mile	Depth in inches on drainage area
July.....	2,180	492	975	1.57	1.81
August.....	586	220	360	.580	.67
September.....	1,520	284	553	.891	.99
October.....	2,100	312	653	1.05	1.21
November.....	1,780	483	829	1.33	1.48
December.....	5,000	655	2,130	3.43	3.95
January.....	3,000	420	1,040	1.67	1.92
February.....	3,000	280	626	1.01	1.05
March.....	6,310	600	3,080	4.96	5.72
April.....	2,920	990	1,540	2.48	2.77
May.....	1,060	340	532	.857	.99
June.....	1,080	242	474	.763	.85
The year.....	6,310	220	1,070	1.72	23.31

LAKE CHAMPLAIN DRAINAGE BASIN

DESCRIPTION OF BASIN

Lake Champlain occupies a long and narrow valley, extending in a north-south direction and forming a part of the boundary between New York and Vermont.

Drainage areas tributary to LAKE CHAMPLAIN *

LOCALITY	AREA IN SQUARE MILES		
	Place to place	Sub-total	Total
Pike river and adjacent area in Canada.....		a 242.00	.....
Missisquoi river in Canada.....		b 245.00	.....
Land area in Canada above outlet.....			487.00
Missisquoi river in Vermont.....		b 615.00	.....
(Total Missisquoi river, 860 square miles.)			
Lamoille river.....		b 725.00	.....
Winooks river.....		b 995.00	.....
Otter creek.....		b 935.00	.....
Eastern coast drainage.....		b 534.40	.....
Mettawee, Poultney and Castleton rivers in Vermont.....		c 376.00	.....
Land area in Vermont, except islands.....			4,180.40
Wood creek above Smith's Basin.....	18.60		.....
Big creek (Washington Co.) above junction with Wood creek.....	35.16	53.76	.....
Wood creek, Smith's Basin to Fort Ann.....	9.90	63.66	.....
Halfway creek above Kane's falls.....	78.82		.....
Halfway creek, Kane's falls to junction with Wood creek at Fort Ann.....	6.69	85.51	.....
Wood creek at Fort Ann, including Halfway creek.....		149.17	.....
Wood creek, Fort Ann to junction with Mettawee.....	55.73	204.90	.....
Mettawee river in Vermont.....	151.90		.....
Mettawee river in New York.....	55.70		.....
Total, Mettawee river.....		207.60	.....
Total, Wood creek and Mettawee river at junction.....		412.50	.....
Wood creek, junction Mettawee river to Whitehall.....	13.65	426.15	.....
Wood creek, Whitehall to junction with Poultney river.....	1.65	427.80	.....
Castleton river, in Vermont.....	100.90		.....
Poultney river, including Castleton river in Vermont.....		254.80	.....
Poultney river in New York.....		11.00	.....
Poultney river, total to junction with Wood creek.....		265.80	.....
Total, Wood creek and Poultney river at junction.....			693.60
Wood creek, Mettawee and Poultney rivers in New York.....		286.90	.....
Lake George outlet.....		220.10	.....
Bouquet river.....		c 268.10	.....
Ausable river.....		d 521.30	.....
Little Ausable river.....		d 75.10	.....
Saranac river.....		d 629.60	.....
Little Chazy river.....		c 63.80	.....
Big Chazy river.....		d 299.40	.....
Western coast drainage.....		d 344.60	.....
Land area in New York, except islands.....			2,708.90
Islands in New York.....		e 55.20	.....
Total land area above outlet.....			7,431.50
Water-surface in Canada.....		e 16.50	.....
Water-surface in United States.....		e 419.10	.....
Total water-surface.....		435.60	.....
Total drainage area above outlet.....			7,867.10
Richelieu river, Rouses Point to Chambly.....	a 310.00		.....
Total drainage area above Chambly.....			8,177.10
Richelieu river, Chambly to mouth.....	a 626.30		.....
Richelieu river, total.....		936.30	.....
Total drainage area above mouth.....			8,803.40

* Table here presented is a revision of that appearing in the 1917 report. a From maps of Canadian Geological Survey. Scale: 1 inch = 4 miles. b United States post-route maps. Scale 1 inch = 12.5 miles. c Topographic maps of U. S. G. S. Scale: 1 inch = 1 mile (nearly). d Bien's Atlas of New York. Scale: 1 inch = 2.5 miles. e Charts of U. S. Coast and Geodetic Survey. Scale: 1:40,000.

LAKE CHAMPLAIN

The fluctuation of the lake surface has an extreme range of nearly ten feet. Records showing the water-surface of Lake Champlain are kept at Fort Montgomery and Burlington by the United States government and at Whitehall by the State of New York. The government elevations are referred to mean sea-level at Sandy Hook, while the State elevations are referred to Barge canal datum. To convert elevations in this region given by the Federal government, referred to mean sea-level, to elevations referred to Barge canal datum, add 0.81 foot. It is to be noted that the similar relation at Albany is 0.87 foot.

LAKE CHAMPLAIN AT WHITEHALL

Gage No. 126

Location.—Below lock No. 12 in the village of Whitehall.

Records available.—January 22, 1905, to June 30, 1921.

Gage.—Staff in two sections, the lower section is on the north face of the lower west approach wall; the upper section is on the lower east thrust wall.

Discharge.—No discharge obtained.

Accuracy.—Gage read twice daily to half-tenths.

Coöperation.—Station established by this Department. Gage read by employees of the Department of Public Works.

Daily elevation of water-surface (B. C. datum) of LAKE CHAMPLAIN AT WHITEHALL
for the year ending June 30, 1921

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	96.42	95.7	95.22	96.55	95.7	95.55	97.95	96.62	96.2	100.4	98.68	96.3
2.....	96.28	95.7	95.3	95.7	94.88	96.75	97.72	96.45	96.25	99.8	98.52	96.65
3.....	96.05	95.78	95.3	95.55	94.82	96.25	97.85	96.38	96.5	99.95	98.7	95.85
4.....	96.12	95.65	95.05	95.5	95.2	96.1	97.9	96.45	96.75	99.78	98.6	96.3
5.....	96.15	95.5	94.85	96.15	95.15	96.6	97.8	96.35	96.4	100.02	98.22	96.25
6.....	95.9	95.38	94.8	96.25	95.35	98.15	97.95	96.55	96.15	99.7	98.2	95.95
7.....	95.75	95.25	94.78	95.65	95.4	97.55	97.6	96.52	96.8	99.35	98.28	95.9
8.....	95.9	95.35	94.9	95.6	95.2	97.55	97.75	96.45	97.15	99.1	98.15	96.15
9.....	96.05	95.3	94.75	95.62	94.9	97.3	97.6	96.22	97.2	99.22	97.95	95.85
10.....	96.08	95.22	94.8	95.8	95.15	97.2	97.5	96.38	97.95	99.82	98.05	95.65
11.....	96.0	95.35	94.82	95.8	95.05	97.2	97.48	96.38	97.18	99.82	97.6	95.45
12.....	96.0	95.42	94.5	95.75	94.9	97.2	97.45	96.3	97.28	99.25	97.35	95.95
13.....	95.9	95.35	95.4	95.7	95.0	97.1	97.45	96.18	98.15	99.05	97.3	96.0
14.....	95.8	95.28	96.15	95.6	94.9	97.65	97.35	96.32	98.12	99.5	97.28	95.88
15.....	95.88	95.3	95.1	95.7	94.9	99.6	97.5	96.15	98.38	98.6	97.05	96.1
16.....	95.9	95.32	94.85	95.58	94.85	98.55	97.25	96.0	98.38	98.9	97.25	95.95
17.....	95.82	95.6	94.98	95.68	95.35	98.45	97.28	96.1	98.38	99.68	97.2	95.75
18.....	95.78	95.7	94.65	95.28	95.3	98.38	97.3	96.25	98.78	99.15	97.15	95.9
19.....	95.85	95.6	95.1	95.28	94.98	98.25	97.18	96.08	98.32	99.0	96.98	95.88
20.....	95.92	95.15	95.1	95.2	95.65	98.32	96.75	96.25	98.5	98.8	96.65	95.48

Daily elevation of water-surface (B. C. datum) of LAKE CHAMPLAIN AT WHITEHALL
for the year ending June 30, 1921 — *Continued*

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
21.....	95.9	94.8	95.0	95.25	95.4	98.35	97.1	96.2	93.75	98.58	96.55	95.25
22.....	95.95	95.15	94.8	95.7	95.28	98.28	97.1	96.05	99.35	99.08	96.6	95.25
23.....	95.78	95.6	94.85	95.45	96.2	98.15	96.95	95.92	99.2	98.7	97.62	95.22
24.....	95.92	95.35	94.85	95.15	96.05	98.30	97.1	96.08	98.98	98.8	96.55	95.45
25.....	96.05	95.15	94.88	95.08	95.75	98.35	97.02	96.0	99.4	98.88	96.38	95.35
26.....	95.9	95.0	95.0	95.1	95.55	98.02	96.95	96.05	99.55	98.85	96.65	95.35
27.....	95.72	95.0	94.75	94.6	95.5	98.05	96.85	96.02	99.53	98.7	96.45	95.3
28.....	95.7	95.0	94.78	95.05	95.65	98.1	96.85	95.98	98.5	98.68	96.28	95.22
29.....	95.4	94.9	94.7	95.55	95.5	98.08	96.65	.....	100.2	98.58	96.32	95.3
30.....	95.28	94.78	95.55	95.1	95.5	98.42	96.78	.....	99.58	98.58	96.32	95.15
31.....	95.35	94.8	.....	95.0	.....	98.0	96.78	.....	99.35	.....	95.92	.....

RICHELIEU RIVER AT FORT MONTGOMERY, ROUSES POINT

Location.—Inside the fort, three-eighths mile south of International boundary, about half a mile above head of Richelieu river, the outlet of Lake Champlain, and 1 mile northeast of Rouses Point, Clinton county.

Drainage area.—7,870 square miles, including 436 square miles of water surface (from annual report of State Engineer and Surveyor).

Records available.—1875 to June 30, 1921.

Gage.—Staff, inside of fort; read by Thomas Bourke. Elevation of gage zero, 92.50 feet above mean sea level.

Extremes of stage.—Maximum elevation recorded during year, 99.22 feet at 10 A. M. March 31; minimum elevation recorded, 93.57 feet at 10 A. M. September 13.

1869–1921: Maximum elevation recorded, 103.28 feet April, 1869; * minimum elevation recorded, 91.9 feet November 13, 1908.

Coöperation.—Gage heights observed under direction of the corps of engineers of the United States army and reported monthly to the United States Geological Survey.

Daily gage height, in feet, RICHELIEU RIVER AT FORT MONTGOMERY, ROUSES POINT,
for the year ending June 30, 1921

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	2.27	2.00	1.25	1.50	1.40	1.73	4.15	2.90	2.27	6.05	4.53	2.35
2.....	2.25	1.95	1.23	1.82	1.75	1.75	4.17	2.85	2.45	6.58	4.50	2.47
3.....	2.42	1.90	1.22	2.02	1.47	2.07	4.05	2.88	2.42	6.18	4.45	2.50
4.....	2.23	1.88	1.24	2.05	1.50	2.15	4.05	2.77	2.40	6.05	4.37	2.30
5.....	2.10	1.88	1.21	1.90	1.47	2.25	4.08	2.75	2.47	5.95	4.30	2.28
6.....	2.18	1.83	1.23	1.96	1.46	2.53	3.95	2.68	2.58	5.92	4.16	2.30
7.....	2.35	1.81	1.20	2.08	1.47	2.85	3.98	2.65	2.55	6.15	4.10	2.23
8.....	2.15	1.78	1.18	2.02	1.48	2.97	3.93	2.60	2.68	5.90	4.06	2.19
9.....	2.08	1.76	1.22	2.05	1.75	3.25	3.90	2.62	2.97	5.58	3.95	2.17
10.....	2.15	1.75	1.19	1.92	1.50	3.32	3.87	2.56	3.30	5.50	3.90	2.15

*Hoyt, J. C., U. S. Geol. Survey, Water-Supply Paper 97, p. 340.

Daily gage height, in feet, RICHÉLIEU RIVER AT FORT MONTGOMERY, ROUSES POINT,
for the year ending June 30, 1921 — *Continued*

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June ¹
11.	2.10	1.67	1.16	1.95	1.48	3.32	3.82	2.52	3.53	5.46	3.67	2.18
12.	2.10	1.63	1.22	1.92	1.55	3.35	3.75	2.50	3.73	5.45	3.90	1.90
13.	2.10	1.62	1.07	1.90	1.50	3.40	3.70	2.48	3.98	5.42	3.73	2.15
14.	2.15	1.62	1.15	1.88	1.47	3.48	3.72	2.45	4.15	5.20	3.60	1.83
15.	2.07	1.64	1.22	1.85	1.43	4.00	3.60	2.43	4.38	5.40	3.48	1.80
16.	2.00	1.65	1.35	1.81	1.40	4.47	3.57	2.42	4.50	5.02	3.35	1.85
17.	2.00	1.59	1.25	1.78	1.43	4.63	3.55	2.40	4.75	4.75	3.28	1.88
18.	2.05	1.54	1.23	1.75	1.42	4.70	3.52	2.35	4.83	4.98	3.20	1.80
19.	2.12	1.55	1.20	1.73	1.50	4.77	3.45	2.33	5.13	5.00	3.17	1.73
20.	2.10	1.62	1.23	1.74	1.38	4.68	3.46	2.30	4.95	5.02	3.25	1.75
21.	2.23	1.75	1.25	1.75	1.35	4.52	3.38	2.30	5.22	4.93	3.18	1.75
22.	2.18	1.40	1.27	1.58	1.53	4.60	3.32	2.35	5.25	4.92	3.10	1.70
23.	2.15	1.47	1.27	1.63	1.56	4.77	3.25	2.35	5.73	5.05	2.75	1.68
24.	2.13	1.43	1.25	1.73	1.63	4.70	3.18	2.28	5.90	5.00	2.95	1.60
25.	2.07	1.43	1.23	1.60	1.65	4.38	3.15	2.25	5.97	4.87	2.97	1.55
26.	2.08	1.42	1.22	1.67	1.65	4.48	3.14	2.22	5.93	4.80	2.78	1.50
27.	2.00	1.40	1.23	1.80	1.70	4.57	3.12	2.20	6.20	4.85	2.72	1.50
28.	2.03	1.37	1.22	1.50	1.67	4.30	3.08	2.20	6.07	4.75	2.65	1.52
29.	2.13	1.39	1.25	1.45	1.68	4.25	3.05	.....	6.12	4.67	2.62	1.55
30.	2.05	1.38	1.23	1.47	1.75	4.18	2.98	.....	6.55	4.65	2.55	1.47
31.	2.03	1.38	.....	1.45	.....	4.13	2.95	.....	6.72	.....	2.53	.....

AUSABLE RIVER

DESCRIPTION

Ausable river is formed by the junction of the east and west branches, which have their headwaters in the northwestern part of Essex county. The east branch flows from upper Ausable lake, at an elevation of 1,990 feet above sea-level. The west branch, formed by several small streams that lie in the valley to the west and north of the east branch, receives the outflow from Lake Placid at elevation 1,864 feet. Both branches flow north and east to their junction at the village of Ausable Forks, from which point the river continues in a northeast direction and enters Lake Champlain about 10 miles south of Plattsburg. From the Forks to the lake the river covers a distance of 19 miles and drops 445 feet, of which 130 feet is in the Ausable Chasm, 60 feet being in the fall at the entrance and 70 feet in one mile of rapids. There are few lakes in this drainage area to act as regulators of the flow, and, owing to the great differences of elevation throughout the area, the stream has what is called a flashy discharge, its fluctuations being large and rapid.

Owing to the fact that this basin lies on the eastern slope of the Adirondack mountains, the average rainfall is less than for those basins whose streams rise on the western and southern slopes, the mean yearly precipitation being about 32 inches.

Drainage areas of Ausable River

LOCATION	AREA	
	Place to place	Total
	<i>Square miles</i>	<i>Square miles</i>
Lake Placid water-surface.....	.....	4
Lake Placid drainage area.....	22	22
West Branch from Lake Placid to Ausable Forks.....	213	235
East Branch above Ausable Forks.....	199	434
Ausable Forks to Keeseville.....	41	475
Keeseville to Ausable Chaam.....	25	500
Ausable Chaam to mouth.....	18	518

AUSABLE RIVER AT AUSABLE FORKS

Location.—In the village of Ausable Forks, Clinton county, immediately below junction of east and west branches and about 15 miles above mouth of river.

Drainage area.—444 square miles (measured on topographic maps).

Records available.—August 17, 1910, to June 30, 1921.

Gage.—Chain on left bank 1,000 feet below junction of east and west branches; read by A. S. Baker.

Discharge measurements.—Made from a cable $11\frac{1}{2}$ miles below gage, or by wading either near the cable or a short distance above the gage.

Channel and control.—Stone and gravel; occasionally shifting. Channel divided by an island opposite the gage.

Extremes of discharge.—Maximum stage recorded during year, 8.6 feet at 7 A. M. March 21 (discharge, 13,800 second-feet); minimum stage recorded, 3.43 feet at 7 A. M. August 28 and 5 P. M. June 29 (discharge, 126 second-feet).

1910–1921: Maximum stage recorded, 10.2 feet in the evening of March 27, 1913 (discharge, roughly 25,000 second-feet); minimum stage recorded, 3.0 feet at 7 A. M. July 21, 1912 (discharge, practically zero).

Ice.—Stage-discharge relation slightly affected by ice.

Accuracy.—Stage-discharge relation practically permanent during the year except as affected by ice December to February. Rating curb fairly well defined between 175 and 3,000 second-feet. Gage read to hundredths twice daily. Daily discharge ascertained by applying mean daily gage height to rating table. Open water records good; winter records fair.

Coöperation.—Station maintained by the United States Geological Survey in coöperation with the State Engineer and Surveyor.

GAGING OF STREAMS: LAKE CHAMPLAIN BASIN 121

Discharge measurements of AUSABLE RIVER AT AUSABLE FORKS, during the year ending June 30, 1921

DATE	Made by	Gage height	Discharge
Aug. 18.....	S. M. Currier.....	<i>Feet</i> 3.66	<i>Sec.-ft.</i> 276
Jan. 20.....	Currier and Harrington.....	a 4.41	288

a Stage-discharge relation affected by ice.

Daily discharge, in second-feet, of AUSABLE RIVER AT AUSABLE FORKS, for the year ending June 30, 1921

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	264	264	257	4,210	354	446	1,000	280	336	1,940	929	202
2.....	272	242	257	1,830	446	1,440	1,100	320	436	1,620	851	196
3.....	272	234	227	838	1,620	1,620	1,200	320	929	1,440	739	202
4.....	354	214	214	800	1,070	1,530	800	300	955	998	955	214
5.....	407	208	208	494	800	1,620	700	280	515	970	536	221
6.....	536	189	214	407	588	3,320	600	340	764	1,230	426	214
7.....	890	196	221	379	578	3,320	650	400	1,260	1,440	426	202
8.....	788	170	183	345	567	3,190	750	380	3,440	1,260	371	177
9.....	1,030	157	214	287	567	3,070	700	371	8,400	1,150	845	164
10.....	645	189	208	227	984	2,960	650	294	4,480	998	336	137
11.....	484	234	234	242	851	2,840	600	264	2,950	929	328	132
12.....	328	221	287	234	588	929	600	257	1,940	739	336	214
13.....	465	196	484	208	526	1,200	600	264	2,950	656	362	319
14.....	446	202	1,130	208	536	2,060	600	257	2,720	656	371	800
15.....	407	234	955	214	567	4,750	650	257	3,070	751	311	484
16.....	354	230	813	227	567	2,490	550	280	6,800	776	272	388
17.....	311	220	679	202	494	1,530	440	1,730	5,310	1,180	294	319
18.....	319	210	890	202	465	1,230	340	1,150	2,270	1,070	257	234
19.....	903	208	1,130	202	494	984	260	903	2,160	1,040	214	189
20.....	1,440	157	998	227	446	877	280	838	2,720	1,030	221	170
21.....	751	142	819	183	446	813	320	578	12,500	1,040	214	157
22.....	955	153	287	153	446	851	360	546	5,310	1,620	202	164
23.....	505	202	227	196	379	942	380	436	4,210	1,440	202	157
24.....	398	189	221	177	371	1,100	340	319	4,210	1,620	196	164
25.....	350	157	202	208	426	1,100	300	319	5,600	929	183	148
26.....	294	142	196	202	426	1,100	280	336	3,190	916	214	148
27.....	257	142	202	214	407	950	300	336	2,600	851	221	132
28.....	234	132	202	287	398	800	360	345	3,950	800	183	132
29.....	202	157	189	465	426	700	420	.....	2,600	588	214	132
30.....	221	177	622	371	398	800	380	.....	1,530	588	221	132
31.....	242	164	.....	398	.....	900	320	.....	1,830	.....	202	.....

NOTE.—Discharge, December 24, February 8, determined from gage-heights corrected for ice effect from 1 discharge measurement, and study of weather records and observer's notes. No gage readings July 25 and August 16-18; discharge estimated.

Monthly discharge of AUSABLE RIVER AT AUSABLE FORKS, for the year ending June 30, 1921

[Drainage area, 444 square miles]

MONTH	DISCHARGE IN SECOND-FEET				RUN-OFF Depth in inches on drainage area
	Maximum	Minimum	Mean	Per square mile	
July.....	1,440	202	494	1.11	1.28
August.....	264	132	191	.430	.50
September.....	1,130	183	416	.937	1.05
October.....	4,210	153	479	1.08	1.24
November.....	1,620	354	574	1.29	1.44
December.....	4,750	446	1,060	3.74	4.31
January.....	1,200	260	543	1.22	1.41
February.....	1,730	257	454	1.02	1.06
March.....	12,500	336	3,290	7.41	8.54
April.....	1,940	588	1,080	2.43	2.71
May.....	955	183	359	.809	.93
June.....	800	132	221	.498	.56
The year.....	12,500	132	818	1.84	25.03

WEST BRANCH OF AUSABLE RIVER NEAR NEWMAN

Location.— On farm of James Dudley, about 4 miles northeast of Newman, Essex county, and 4 miles below confluence at Lake Placid.

Drainage area.—116 square miles (measured on topographic maps).

Records available.— June 7, 1916, to December 31, 1917, and July 15, 1919, to June 30, 1921.

Gage.— Staff, in two sections, on the right bank near the residence of Mr. Dudley. Lower section is inclined, graduated from 1.0 to 6.5 feet; the upper section is vertical, graduated from 6.55 to 10.1 feet; read by Mrs. Ethel Fuller.

Discharge measurements.— Made from cable 300 feet above gage or by wading.

Channel and control.— Solid rock.

Extremes of discharge.— Maximum open water stage recorded during year, 8.0 feet at 5 P. M. March 21 (discharge about 5,700 second-feet); minimum stage recorded, 1.60 feet at 7:30 P. M. September 13 (discharge, practically zero).

1916-17 and 1919-21: Maximum open water stage recorded, that of current year; minimum stage recorded, that of current year.

Ice.— Stage-discharge relation affected by ice.

Accuracy.— Stage-discharge relation permanent except as affected by logs on control in July and by ice, January to March. Rating curve fairly well defined between 50 and 1,500 second-feet, approximate above. Gage read to half-tenths twice daily. Daily discharge ascertained by applying mean daily gage-height to rating table. Records only fair as mean daily gage-height from two readings may be subject to error due to fluctuations in

stage caused by operation of dams upstream. Winter records fair.

Coöperation.—Station established and maintained by the United States Geological Survey in coöperation with the State Engineer and Surveyor.

Discharge measurements of WEST BRANCH OF AUSABLE RIVER NEAR NEWMAN, during the year ending June 30, 1921

DATE	Made by	Gage height	Discharge
		<i>Feet</i>	<i>Sec.-ft.</i>
Aug. 17	B. F. Howe	2.65	51.3
Sept. 26	Covert and Currier	2.56	52.0
Jan. 21	Harrington and Currier	a 3.00	79.8
Feb. 23	S. M. Currier	a 3.11	82.0
Mar. 9	S. M. Currier	a 6.80	1,230
Mar. 23	S. M. Currier	4.54	725
April 18	B. F. Howe	3.69	360
April 18	B. F. Howe	3.65	339

a Backwater from ice.

Daily discharge, in second-feet, of WEST BRANCH OF AUSABLE RIVER NEAR NEWMAN, for the year ending June 30, 1921

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1	114	13	112	1,320	84	81	112	55	80	696	216	67
2	94	97	68	661	174	68	150	65	80	438	183	62
3	114	16	62	305	730	348	305	65	150	370	162	76
4	142	8.4	47	286	266	232	282	50	110	326	180	82
5	374	8.4	45	174	232	392	201	60	120	305	121	76
6	256	174	47	266	174	960	174	60	150	415	130	73
7	270	90	55	130	174	487	112	75	440	415	107	71
8	668	50	47	92	174	326	150	75	809	370	98	58
9	256	97	45	112	121	174	112	75	1,400	487	107	53
10	256	94	57	95	348	174	112	60	1,400	326	102	55
11	142	77	62	84	201	130	81	60	805	249	110	58
12	220	84	42	81	150	150	68	60	540	216	73	130
13	190	77	30	74	140	150	68	50	630	174	85	130
14	164	150	88	66	112	150	81	50	487	174	107	188
15	164	130	68	74	104	1,850	174	32	438	216	107	110
16	123	71	62	68	84	1,130	140	70	2,210	370	98	107
17	104	89	68	81	81	392	110	240	1,130	487	82	62
18	94	68	66	74	95	348	80	180	661	326	80	62
19	397	74	52	68	95	305	75	180	438	286	73	48
20	775	47	150	74	68	266	80	150	1,090	286	67	51
21	467	52	57	66	68	266	80	110	5,700	232	55	51
22	235	57	95	59	68	201	95	95	2,090	348	60	55
23	142	92	104	59	95	232	110	85	768	140	76	51
24	164	62	74	59	100	201	90	76	540	286	67	53
25	77	52	71	57	112	150	65	48	1,630	232	65	51
26	21	45	62	59	95	150	46	38	1,130	514	67	36
27	18	55	57	66	81	112	46	76	1,040	201	67	36
28	9.4	40	81	305	81	112	44	80	842	174	62	41
29	7.8	52	95	201	81	112	75	.....	960	150	60	41
30	9.4	55	92	88	81	130	65	.....	540	188	58	65
31	11	81	.....	81	.....	150	55	.....	415	.....	58	.....

NOTE.—Discharge January 16 to March 10, determined from gage-heights corrected for ice effect from 3 discharge measurements, study of weather records and observer's notes and comparison with record of Ausable River at Ausable Forks. Discharge July 1 to 24 ascertained by indirect method on account of logs on control. Discharge estimated November 24.

Monthly discharge of WEST BRANCH OF AUSABLE RIVER NEAR NEWMAN, for the
year ending June 30, 1921
[Drainage area, 116 square miles]

MONTH	DISCHARGE IN SECOND-FEET				RUN-OFF
	Maximum	Minimum	Mean	Per square mile	Depth in inches on drainage area
July.....	775	7.8	196	1.69	1.95
August.....	174	8.4	68.3	.589	.68
September.....	150	30	68.7	.592	.66
October.....	1,320	57	170	1.47	1.70
November.....	730	68	149	1.28	1.43
December.....	1,850	68	320	2.76	3.18
January.....	305	44	109	.940	1.08
February.....	240	32	82.4	.710	.74
March.....	5,700	80	920	7.93	9.14
April.....	696	140	313	2.70	3.01
May.....	216	55	95.4	.822	.95
June.....	188	36	70.0	.603	.67
The year.....	5,700	7.8	215	1.85	25.19

SARANAC RIVER

DESCRIPTION

Saranac river rises in southeastern Franklin county and flows northeastward to a point near Cadyville and thence eastward into Lake Champlain at Plattsburg. The southern boundary of the basin is the Ampersand mountain range and the stream drains the north slope of the most elevated region of the state of New York. About 16.2 per cent of the upper drainage area is water-surface. The areas tributary to the river are shown in the following table:

Drainage areas of Saranac River *

LOCATION	Area. square miles
Bartlett Carry.....	77
Saranac Lake Village.....	185
Pyramid Rapids.....	280
Franklin Falls.....	293
Union Falls.....	330
Tefft Pond.....	347
North Branch, at mouth.....	128
Clayburg (below mouth of North Branch).....	480
High Falls.....	495
Cadyville.....	576
Plattsburg (mouth of river).....	613

* From Fourth Annual Report of the Conservation Commission.

SARANAC RIVER NEAR PLATTSBURG

Location.— At the Indian Rapids power plant (formerly known as Lozier dam) of the Plattsburg Gas and Electric Company, about 6 miles above mouth of river at Plattsburg, Clinton county.

Drainage area.— 607 square miles (measured on topographic maps).

Records available.— March 27, 1903, to June 30, 1921.

Gages.— Gage showing elevation of water surface above intake to power plant is a Gurley 7-day graph water-stage recorder, installed November 12, 1919, in a shelter attached to retaining wall at power house on right side of river. Before that date the crest gage was a vertical staff on the angle of the wing wall at the end of the racks. Datum raised 0.76 foot August 20, 1906. Tailrace gage a vertical staff spiked to timber work dike between tailrace and river and about 50 feet below power house. Records of kilowatt output are obtained by watt meter on switchboard at half-hour intervals. Inclined staff gage at cable station a quarter of a mile below dam.

Discharge measurements.— Made from a cable at head of Indian rapids, $\frac{1}{4}$ mile below dam. Low-water measurements made by wading under cable or in tailrace. Gages and watt meters read by power house operators.

Discharge rating.— Records include flow over concrete spillway 171.25 feet in crest length, a rating for which has been prepared for use of coefficients* derived from experiments made in the hydraulic laboratory of Cornell University on a model section of the dam; the discharge through two power units equipped with 300-kilowatt generators which have been rated by current-meter measurements; and the discharge through two 5-foot waste gages when open. Occasional observations are made on the inclined staff gage at the cable as a check on the ratings of the spillway and turbines.

Extremes of discharge.— Maximum daily discharge during year, 4,900 second-feet, March 22; minimum daily discharge, 310 second-feet, May 31 and June 26.

1908-1921: Maximum daily discharge recorded, 6,410 second-feet, April 20, 1914; minimum daily discharge recorded, 90 second-feet, September 28, 1914.

Special study.— A portable water-stage recorder was operated at the cable for a short period in July, 1914. Mean daily discharge computed from its record agreed very closely with mean daily discharge derived from power plant ratings.

Ice.— The crest of the spillway is kept free from ice so that the stage-discharge relation is not affected.

* Horton, R. E., Weir experiments, coefficients, and formulas; U. S. Geol. Survey Water-Supply Paper 200, pp. 98-100, 1907.

Regulation.—The lakes and ponds on the main stream and tributaries above the station comprise a water-surface area of about 25.5 square miles. The actual storage afforded by these reservoirs has been largely increased by the State dam at Lower Saranac lake, the operation of which affects the distribution of flow throughout the year.

Accuracy.—Discharge over the spillway ascertained by applying to rating table mean gage heights for 6-hour periods. Discharge through the turbines ascertained by applying to their ratings the mean kilowatt output and head for periods of run. Records, fair.

Coöperation.—Gage-height records and watt meter readings furnished by Plattsburg Gas and Electric Company; Herbert A. Stutchbury, superintendent. Discharge record computed by United States Geological Survey.

No discharge measurements were made at this station during the year.

Daily discharge, in second-feet, of SARANAC RIVER NEAR PLATTSBURG, for the year ending June 30, 1921

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	580	480	640	1,080	640	600	860	440	700	2,100	1,020	540
2.....	450	680	640	1,180	520	1,180	820	480	680	1,950	1,000	520
3.....	430	660	490	760	700	1,020	1,060	560	940	1,950	900	560
4.....	680	640	440	740	640	1,200	920	540	1,100	1,800	900	500
5.....	480	520	350	560	640	1,180	1,000	560	840	1,750	940	500
6.....	640	460	480	640	680	1,500	980	560	940	1,700	820	520
7.....	480	440	400	700	560	1,300	800	600	1,950	1,600	800	520
8.....	660	480	700	720	660	1,300	900	580	1,800	1,500	760	540
9.....	700	520	490	700	520	1,140	820	500	2,800	1,400	480	500
10.....	640	450	660	580	720	1,220	760	520	4,100	1,400	660	470
11.....	360	450	380	620	720	1,300	820	600	3,700	980	660	560
12.....	600	560	330	420	720	1,260	780	520	8,500	1,160	640	540
13.....	660	600	720	500	560	1,200	700	480	3,200	1,140	640	500
14.....	620	460	820	480	380	1,450	720	560	2,700	1,160	640	540
15.....	580	640	720	440	660	2,250	820	890	2,250	1,040	660	540
16.....	560	700	560	590	490	2,100	740	440	2,900	1,080	620	600
17.....	500	440	640	620	640	1,800	620	660	2,900	1,300	620	620
18.....	360	470	540	390	620	1,600	370	660	2,600	1,200	560	580
19.....	1,040	440	500	540	700	1,450	640	760	2,000	1,300	560	400
20.....	1,350	410	620	620	660	1,120	620	740	2,500	1,350	500	500
21.....	1,120	450	440	620	370	1,080	720	660	4,800	1,240	540	340
22.....	1,000	370	430	620	580	1,000	640	680	4,900	1,450	520	410
23.....	820	470	560	640	570	1,120	780	640	8,600	1,600	540	360
24.....	860	390	540	620	480	1,300	740	680	2,900	1,550	500	360
25.....	760	420	490	540	560	820	620	600	2,700	1,550	450	350
26.....	740	420	350	480	780	660	580	580	2,800	1,450	490	310
27.....	660	400	520	620	720	800	580	520	2,450	1,250	350	420
28.....	660	410	390	640	500	880	600	600	2,250	1,220	370	410
29.....	580	350	580	640	680	940	620	.....	2,350	1,140	400	460
30.....	500	500	500	740	620	840	540	.....	2,250	1,080	330	450
31.....	620	580	.....	360	.....	780	520	.....	2,000	.....	310	.....

GAGING OF STREAMS: LAKE CHAMPLAIN BASIN 127

Monthly discharge of SARANAC RIVER NEAR PLATTSBURG, for the year ending June 30, 1921

[Drainage area, 697 square miles]

MONTH	DISCHARGE IN SECOND-FEET				RUN-OFF
	Maximum	Minimum	Mean	Per square mile	Depth in inches on drainage area
July.....	1,350	360	668	1.10	1.27
August.....	700	350	492	.811	.94
September.....	820	320	531	.875	.98
October.....	1,180	360	623	1.03	1.19
November.....	780	370	609	1.00	1.12
December.....	2,250	600	1,200	1.98	2.28
January.....	1,060	370	722	1.21	1.40
February.....	860	390	582	.950	1.00
March.....	4,900	680	2,490	4.10	4.73
April.....	2,100	980	1,410	2.32	2.69
May.....	1,020	310	617	1.02	1.18
June.....	620	310	481	.792	.88
The year.....	4,900	310	873	1.44	19.56

HUDSON RIVER DRAINAGE BASIN

HUDSON RIVER

The Hudson river rises in the western part of Essex county and flows in a southerly direction to New York bay. The total length of the river is about 300 miles. Above Hadley no power has been developed though the fall of the river is quite rapid. Between Hadley and Troy there is a total fall of 565 feet, of which about 425 is at present developed. Between Fort Edward and Troy the river has been canalized, with the exception of short distances at Stillwater and Northumberland and between the Fort Miller and Crockers Reef dams. Seven dams, three of which are new, form the pools necessary for navigation in this section of the river. These dams are located as follows

Location	Elevation of crest
Troy	15.2
2.9 miles above Waterford	29.5
2 miles below Mechanicville	48.0
Mechanicville	67.5
Stillwater	83.5
Northumberland	102.5
Crockers Reef	119.0

Drainage areas on the Hudson River

Location	Square miles
Above the mouth of Cedar River	248
Below the mouth of Cedar River	412
Gooley gaging station	418
Above the mouth of Indian River	420
Below the mouth of Indian River	619
Kettle Mountain	643
Above the mouth of Boreas River	644
Below the mouth of Boreas River	735
North River	780
North Creek gaging station	789
Huckleberry Mountain	839
Gage Mountain	871
The Glen	902
Millington Brook	938
Above the mouth of Schroon River	963
Below the mouth of Schroon River	1,531
Thurman gaging station	1,550
Above the mouth of Sacandaga River	1,659
Below the mouth of Sacandaga River	2,717
Corinth	2,760
Spier Falls	2,777
Sherman Island	2,782
Feeder Dam	2,790
Glens Falls	2,806
Hudson Falls	2,810
Fort Edward	2,815
Crocker's Reef Dam	2,959
Fort Miller	2,980
Thompson	2,997
Schuylerville	3,360
Stillwater	3,760
Mechanicville, upper dam	4,500
Mechanicville, lower dam	4,570
Waterford	4,620
Troy	8,100
Albany	8,200
Above the mouth of Rondout Creek	10,500
At mouth of Hudson River	13,366

HUDSON RIVER AT GOOLEY NEAR INDIAN LAKE

Location.— One mile above Gooley, Essex county, about a mile below mouth of Cedar river, $1\frac{1}{2}$ miles above mouth of Indian river and 6 miles northeast of Indian Lake village, Hamilton county.

Drainage area.— 418 square miles (measured on topographic maps).

Records available.— August 30, 1916, to June 30, 1921.

Gage.— Gurley printing water-stage recorder on right bank. Inspected by John A. Bolton and Earle Husson.

Discharge measurements.— Made from cable 100 yards below gage, or by wading.

Channel and control.— Solid ledge overlain with coarse gravel; probably permanent.

Extremes of discharge.— Maximum stage during year from water-stage recorder, 8.30 feet at 12:30 A. M., March 22 (discharge, 9,490 second-feet); minimum stage from water-stage recorder, 1.69 feet from 9:45 P. M., June 28, to 6:45 A. M., June 29 (discharge, 132 second-feet).

1916–1921: Maximum stage from water-stage recorder, 9.87 feet at 11 A. M., June 12, 1917 (discharge, 13,500 second-feet); minimum stage from water-stage recorder, 1.43 feet from 11 A. M., September 11, to 8 A. M., September 13, 1916 (discharge, 56 second-feet).

Ice.— Stage-discharge relation affected by ice.

Regulation.— Large diurnal fluctuation, due to logging operations during spring months. Seasonal distribution of flow slightly affected by storage.

Accuracy.— Stage-discharge relation practically permanent, except as affected by ice from December to March. Rating curve fairly well defined between 70 and 600 second-feet and well defined between 600 and 6,000 second-feet. Operation of water-stage recorder satisfactory, except for periods indicated in footnote to daily discharge table. Daily discharge ascertained by applying to rating table mean daily gage height obtained by averaging the hourly gage heights, or for days of considerable variation in stage by averaging the hourly discharge. Records good, except those for period of ice effect, which are fair.

Coöperation.— Station maintained by the United States Geological Survey in coöperation with the State Engineer and Surveyor.

Discharge measurements of HUDSON RIVER AT GOOLEY NEAR INDIAN LAKE, during
the year ending June 30, 1921

DATE	Made by	Gage height	Discharge
		<i>Feet</i>	<i>Sec.-ft.</i>
Sept. 25.....	Currier and Shupe.....	2.23	395
Jan. 15.....	Harrington and Currier.....	a 3.16	425
Jan. 28.....	Shupe and Howe.....	a 2.76	351
Feb. 16.....	S. M. Currier.....	a 2.64	282
Mar. 17.....	Currier and Howe.....	5.83	4,580
April 9.....	B. F. Howe.....	3.00	855

a Backwater from ice.

Daily discharge, in second-feet, of HUDSON RIVER AT GOOLEY NEAR INDIAN LAKE
for the year ending June 30, 1921

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	325	290	280	569	199	416	600	280	600	2,190	1,020	735
2.....	271	295	256	595	256	973	700	260	700	1,950	975	630
3.....	247	295	224	595	325	1,540	800	260	750	1,480	1,060	470
4.....	271	271	216	562	476	1,390	750	220	750	2,200	1,440	378
5.....	336	234	203	458	562	1,340	800	220	850	2,390	1,640	305
6.....	410	203	195	388	562	2,280	850	240	1,000	1,590	1,290	256
7.....	452	171	191	346	518	2,220	600	280	2,000	1,490	975	220
8.....	494	157	183	295	464	1,640	460	240	2,600	2,960	772	203
9.....	518	146	171	256	440	1,340	460	260	3,200	1,110	700	179
10.....	576	157	164	229	562	1,020	380	260	3,820	1,790	665	160
11.....	588	204	153	207	772	850	360	300	3,740	1,740	488	175
12.....	536	315	153	195	810	810	380	300	3,360	700	367	372
13.....	470	300	171	183	700	850	380	300	3,070	1,400	336	372
14.....	440	320	199	175	665	1,230	400	300	2,730	595	388	464
15.....	470	562	203	171	595	4,570	420	300	2,660	2,150	482	470
16.....	422	530	207	164	530	4,060	460	280	3,550	979	506	405
17.....	434	434	216	160	488	3,070	400	380	4,400	1,170	464	330
18.....	440	351	207	160	488	2,220	300	550	4,060	2,210	367	285
19.....	526	300	199	157	476	1,640	300	600	3,000	2,840	300	252
20.....	826	247	187	153	452	1,390	400	500	3,550	1,670	562	229
21.....	1,060	195	175	149	416	1,200	260	420	7,590	1,640	530	216
22.....	982	167	164	149	428	1,150	260	400	8,780	1,830	482	203
23.....	735	157	157	146	446	1,060	280	420	6,200	1,060	295	187
24.....	595	197	406	149	488	890	300	440	3,900	1,560	410	167
25.....	488	229	368	187	562	810	320	440	4,060	810	434	153
26.....	399	211	229	187	595	735	420	440	4,230	2,080	405	142
27.....	330	199	179	179	562	550	400	500	4,740	932	315	139
28.....	271	187	164	203	506	550	360	550	4,740	810	252	135
29.....	216	179	171	211	464	550	300	.....	4,740	810	224	139
30.....	234	187	187	191	500	550	260	.....	4,740	850	276	139
31.....	280	207	.....	188	.....	550	260	.....	2,350	.....	351	.....

NOTE.— Discharge, December 27 to March 9, determined from gage-heights corrected for ice effect by means of 3 discharge measurements, study of gage height graph and weather records, and comparison with records for the station at North Creek and Indian River near Indian Lake. Water stage recorder did not operate December 27 to January 2, January 11–14 and March 8, discharge determined as above.

Monthly discharge of HUDSON RIVER AT GOOLEY, NEAR INDIAN LAKE, for the year ending June 30, 1921

[Drainage area, 418 square miles]

MONTH	DISCHARGE IN SECOND-FEET				RUN-OFF Depth inches on drainage area
	Maximum	Minimum	Mean	Per square mile	
July.....	1,060	216	471	1.13	1.30
August.....	562	146	255	.610	.70
September.....	406	153	206	.493	.55
October.....	595	146	257	.615	.71
November.....	810	199	510	1.22	1.36
December.....	4,570	416	1,400	3.35	3.86
January.....	850	260	439	1.05	1.21
February.....	600	220	355	.849	.88
March.....	8,780	600	3,430	8.21	9.46
April.....	2,960	595	1,570	3.76	4.20
May.....	1,640	224	606	1.45	1.67
June.....	735	135	284	.679	.76
The year.....	8,780	135	821	1.96	26.66

HUDSON RIVER AT NORTH CREEK

Location.— At two-span steel highway bridge in village of North Creek, Warren county, immediately above mouth of North creek.

Drainage area.— 789 square miles.

Records available.— September 21, 1907, to June 30, 1921.

Gage.— Chain at upstream side of left span of the bridge; read by William Alexander.

Discharge measurements.— Made from the upstream side of the highway bridge.

Channel and control.— Heavy gravel; fairly permanent.

Extremes of discharge.— Maximum stage recorded during year, 8.20 feet at 5:30 p. m., March 21 (discharge, 12,800 second-feet) minimum stage recorded, 2.20 feet at 7:30 a. m., September 16, and 5:30 p. m., October 31 (discharge, 275 second-feet).

1907–1921. Maximum stage recorded, 12.0 feet, during the evening of March 27, 1913 (discharge, about 30,000 second-feet); minimum stage, 2.05 feet at 7:05 a. m., September 30, 1913 (discharge, 168 second-feet).

Ice.— Stage-discharge relation affected by ice.

Regulation.— The numerous lakes and ponds in the basin of the Upper Hudson have a decided effect on the low-water flow, especially the reservoir at Indian lake. Many of the reservoirs are used to make flood waves in the spring in connection with log driving.

Accuracy.— Stage-discharge relation practically permanent; affected by ice from December to March. Rating curve well defined between 250 and 6,000 second-feet. Gage read to half-tenths twice daily. Daily discharge ascertained by applying

mean daily gage height to rating table. Open-water records good, except for log-driving season, when mean daily gage height computed from two gage readings per day may be in error owing to large variations in stage caused by operation of sluice gates in logging dams above station. Records for period of ice effect, fair.

Coöperation.—Station maintained by the United States Geological Survey in coöperation with the State Engineer and Surveyor.

Discharge measurements of HUDSON RIVER AT NORTH CREEK, during the year ending June 30, 1921

DATE	Made by	Gage height	Discharge
		<i>Feet</i>	<i>Sec.-ft.</i>
Jan. 11.....	Harrington and Currier.....	a 2.72	585
Jan. 29.....	Shupe and Howe.....	a 3.55	561
Jan. 30.....	Shupe and Howe.....	a 3.57	670
Feb. 18.....	Harrington and Currier.....	a 4.50	1,380
Mar. 16.....	Currier and Howe.....	5.61	5,400
June 25.....	E. B. Shupe.....	2.74	656

a Backwater from ice.

Daily discharge, in second-feet, of HUDSON RIVER AT NORTH CREEK, for the year ending June 30, 1921

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	460	1,100	1,220	1,220	319	700	840	550	1,600	5,600	2,210	940
2.....	460	1,100	1,220	1,220	378	1,220	890	500	1,900	5,600	2,370	890
3.....	446	1,100	945	990	530	2,530	1,100	850	1,900	2,530	2,530	700
4.....	460	990	530	940	700	2,210	1,280	950	1,600	3,610	2,700	570
5.....	495	890	330	745	790	2,370	1,220	950	1,400	3,050	2,870	495
6.....	570	790	990	610	790	3,810	1,040	950	1,700	2,870	2,530	446
7.....	840	840	1,040	610	790	3,610	1,000	1,000	2,000	3,230	1,910	390
8.....	1,220	1,040	990	495	790	2,700	1,100	1,100	3,400	4,890	1,220	360
9.....	1,220	1,100	990	446	700	1,910	750	1,000	4,890	2,210	1,100	330
10.....	1,160	1,100	990	390	610	1,620	600	1,000	6,340	4,440	1,040	302
11.....	1,100	1,220	745	570	1,220	1,480	600	1,300	5,840	3,420	940	302
12.....	1,140	1,220	840	700	1,100	1,350	650	1,500	5,360	1,550	890	840
13.....	840	990	940	700	1,160	1,040	600	1,200	5,120	2,210	745	1,160
14.....	700	700	940	700	990	1,910	550	1,300	4,890	655	745	1,160
15.....	700	1,100	890	700	890	7,680	700	1,400	4,660	1,840	790	1,100
16.....	610	1,100	460	700	790	6,860	750	1,400	5,840	2,370	890	1,160
17.....	570	990	530	655	790	5,840	700	1,400	7,400	1,840	840	990
18.....	610	890	570	610	790	3,420	500	1,400	6,600	4,440	745	890
19.....	1,840	840	890	610	700	2,530	500	1,600	5,840	3,810	655	840
20.....	1,480	790	940	610	610	2,210	500	1,500	5,840	4,220	840	790
21.....	1,350	745	890	610	610	1,910	500	1,400	11,600	4,660	1,760	745
22.....	1,280	890	890	610	610	1,690	550	1,300	6,860	1,760	1,910	700
23.....	1,100	1,100	890	610	700	1,480	600	1,300	10,300	2,530	1,350	700
24.....	840	990	1,040	610	790	1,350	600	1,200	6,860	4,660	700	700
25.....	700	1,040	790	610	890	1,160	500	1,200	7,960	1,760	610	655
26.....	610	990	890	610	1,480	990	500	1,300	7,960	3,230	700	655
27.....	530	990	890	610	890	890	550	1,300	6,860	2,370	610	655
28.....	610	890	890	700	790	890	500	1,500	7,400	1,760	495	700
29.....	700	990	700	446	700	890	550	.....	7,960	1,760	460	700
30.....	790	1,100	530	330	610	890	650	.....	6,340	1,910	570	700
31.....	890	1,100	.....	296	.....	890	600	.....	5,360	.....	495	.....

NOTE.—Discharge, January 7 to March 8, determined from gage-heights corrected for ice effect by means of 4 discharge measurements, observer's notes and weather records. Gage-height record missing January 26.

Monthly discharge of HUDSON RIVER AT NORTH CREEK, for the year ending June 30, 1921

(Drainage area, 780 square miles)

MONTH	DISCHARGE IN SECOND-FEET				RUN-OFF
	Maximum	Minimum	Mean	Per square mile	Depth in inches on drainage area
July.....	1,840	446	849	1.06	1.22
August.....	1,220	700	991	1.23	1.42
September.....	1,220	330	846	1.05	1.17
October.....	1,220	286	653	.812	.94
November.....	1,480	319	784	.975	1.09
December.....	7,680	700	2,260	2.81	3.24
January.....	1,280	500	709	.882	1.02
February.....	1,600	500	1,190	1.48	1.54
March.....	12,200	1,400	5,640	7.01	8.08
April.....	5,600	655	3,030	3.77	4.21
May.....	2,870	460	1,230	1.53	1.76
June.....	1,160	302	719	.894	1.00
The year.....	12,200	286	1,580	1.97	26.69

NOTE.—The monthly discharge in second-feet per square mile and run-off in depth in inches shown by the table do not represent the natural flow from the basin because of artificial storage, mainly in Indian Lake Reservoir. The yearly discharge and run-off doubtless represent more nearly the natural flow.

HUDSON RIVER AT THURMAN

Location.—At Delaware and Hudson railroad bridge, near Thurman railroad station, Warren county, about half a mile below mouth of Schroon river and 13 miles above mouth of Sacandaga river.

Drainage area.—1,550 square miles.

Records available.—September 1, 1907, to September 30, 1920, when the station was discontinued. Comparable records at Hadley, 13 miles below, beginning July 15, 1921.

Gage.—Chain at upstream side of bridge.

Channel and control.—Bed composed of sand and gravel; fairly permanent.

Extremes of discharge.—1907–1920: Maximum stage, 12.5 feet, during late evening of March 27, 1913, determined by leveling from flood marks (discharge, about 46,000 second feet); minimum stage recorded, 2.12 feet at 8:55 A. M. and 6:20 P. M., September 30, 1913 (discharge, about 290 second-feet).

Regulation.—Discharge is regulated to some extent by the storage reservoirs at Indian lake and Schroon lake and the mills on Schroon river.

Accuracy.—Rating curve well defined between 550 and 20,000 second-feet. Gage read to half-tenths twice daily. Daily discharge ascertained by applying mean daily gage height to rating table. Records, fair.

Coöperation.—Gage heights furnished by the International Paper Company. Station maintained by the United States Geological Survey in coöperation with the State Engineer and Surveyor.

Discharge measurements of HUDSON RIVER AT THURMAN, during the year ending June 30, 1921

DATE	Made by	Gage height	Discharge
		<i>Feet</i>	<i>Sec.-ft.</i>
Aug. 20.....	S. M. Currier.....	2.92	1,250
Sept. 3.....	B. F. Howe.....	2.98	1,330
Sept. 3.....	B. F. Howe.....	2.96	1,290

Daily discharge, in second-feet, of HUDSON RIVER AT THURMAN, for the year ending June 30, 1921

DAY	July	Aug.	Sept.	DAY	July	Aug.	Sept.
1.....		960	1,480	16.....	960	1,550	680
2.....		1,550	1,460	17.....	610	1,460	645
3.....		960	1,380	18.....	1,640	1,460	680
4.....		960	680	19.....	1,640	960	680
5.....		960	545	20.....	1,640	645	1,380
6.....		905	578	21.....	1,740	645	680
7.....		1,300	1,380	22.....	1,640	960	960
8.....		960	960	23.....	1,550	1,300	680
9.....		1,300	720	24.....	1,380	960	680
10.....	1,640	1,380	720	25.....	960	960	1,380
11.....	1,460	1,460	680	26.....	645	905	960
12.....	1,460	1,380	645	27.....	645	905	1,380
13.....	1,300	960	1,020	28.....	610	905	720
14.....	1,380	578	1,380	29.....	1,300	1,300	680
15.....	680	1,020	720	30.....	680	1,300	680
				31.....	905	1,380	.....

NOTE.—Mean daily discharge July 1 to 9 estimated at 1,070 second-feet from North Creek record; no gage heights.

Monthly discharge of HUDSON RIVER AT THURMAN, for the year ending June 30, 1921
[Drainage area, 1,550 square miles]

MONTH	DISCHARGE IN SECOND-FEET				RUN-OFF
	Maximum	Minimum	Mean	Per square mile	Depth in inches on drainage area
July.....	1,740	610	1,160	.749	.86
August.....	1,550	578	1,100	.710	.82
September.....	1,460	545	906	.584	.65

HUDSON RIVER AT SPIER FALLS

Location.—Half a mile below Spier Falls dam, Saratoga county, and $11\frac{1}{2}$ miles below mouth of Sacandaga river.

Drainage area.—2,777* square miles (measured on topographic maps).

Records available.—October 7, 1912, to June 30, 1921.

Gage.—Gurley 2-day water-stage recorder in brick shelter on the right bank. Recorder inspected by T. F. Malone, chief operator of power plant.

Discharge measurements.—Made from a cable about 1,000 feet downstream from the gage.

Channel and control.—Bed composed of coarse gravel and boulders. Control probably permanent.

Extremes of discharge.—Maximum stage during year from water-stage recorder, 11.79 feet at 1:15 p. m., March 22 (discharge, 32,800 second-feet); minimum stage, 1.05 feet at 4 to 5 a. m., September 9 (discharge, 174 second-feet).

1912–1921: Maximum stage from water-stage recorder, 18.59 feet at 12:25 a. m., March 28, 1913 (discharge, about 89,100 second-feet); minimum stage, minus 0.12 foot at 4 p. m., September 23, 1917, observed during current-meter measurement (discharge, about 5.5 second-feet).

Ice.—Stage-discharge relation not affected by ice, except for a short time during extremely cold periods.

Regulation.—Large diurnal fluctuation in discharge is caused by operation of the Spier Falls power plant. Seasonal flow affected by storage at Indian lake and many small lakes and reservoirs in the upper part of the drainage basin.

Diversions.—Water is diverted from Hudson river through the Glens Falls canal. A portion flows north into Lake Champlain. No correction has been made for this diversion.

Accuracy.—Stage-discharge relation practically permanent; not affected by ice during the year. Rating curve well defined for all stages except about 9 feet, where curve may be 4 per cent or 5 per cent large. Operation of the water-stage recorder satisfactory throughout the year. Daily discharge ascertained by averaging the results obtained by applying gage heights for 1-hour intervals to the rating table. Records good.

Coöperation.—Water-stage recorder inspected by an employee of the Adirondack Electric Power Corporation. Station maintained by the United States Geological Survey in coöperation with the State Engineer and Surveyor.

* Previously published as 2,800 square miles.

**Discharge measurements of HUDSON RIVER AT SPIER FALLS, during the year ending
June 30, 1921**

DATE	Made by	Gage height	Discharge
		<i>Feet</i>	<i>Sec.-ft.</i>
Feb. 10.....	A. H. Davison *	3.95	3,570
Mar. 9.....	A. H. Davison *	6.65	10,200
Mar. 15.....	A. H. Davison *	9.28	19,800
Mar. 23.....	A. H. Davison *	11.39	29,500

* Engineer, International Paper Company.

**Daily discharge, in second-feet, of HUDSON RIVER AT SPIER FALLS, for the year ending
June 30, 1921**

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	1,450	1,260	1,580	4,510	1,600	3,130	3,710	2,200	2,560	17,500	9,040	2,110
2.....	1,300	2,440	1,980	6,550	1,740	5,440	3,920	1,870	2,760	16,000	10,000	2,040
3.....	3,030	2,210	2,080	5,070	2,960	8,190	4,800	1,930	2,820	15,000	9,820	2,130
4.....	2,880	1,890	2,000	4,760	3,280	8,200	5,260	2,310	3,620	13,000	9,400	1,810
5.....	335	2,000	892	4,150	3,870	8,900	5,310	3,140	3,820	13,800	9,070	689
6.....	1,520	1,820	638	2,810	3,510	12,900	5,230	1,660	3,470	10,800	8,020	1,930
7.....	1,940	1,730	1,790	1,960	1,760	13,200	4,470	3,260	5,950	9,960	6,780	1,360
8.....	1,850	718	1,500	2,400	3,210	11,400	3,660	2,490	7,920	9,490	5,420	1,280
9.....	2,810	1,950	1,640	1,990	2,500	9,240	3,320	2,380	11,500	10,400	4,500	1,200
10.....	2,210	1,880	1,560	1,030	2,850	8,110	4,200	2,160	18,800	8,130	4,300	1,250
11.....	1,560	1,780	2,100	1,870	3,200	7,110	3,070	3,270	19,000	8,170	3,480	1,040
12.....	2,980	2,320	861	1,590	3,970	5,940	2,320	2,570	22,500	7,050	3,470	1,430
13.....	2,430	3,490	1,760	1,780	3,790	5,250	2,500	1,590	22,500	6,670	3,300	1,520
14.....	2,650	2,580	2,080	1,730	1,470	8,670	2,720	2,900	23,300	5,160	3,310	2,690
15.....	2,580	2,770	2,070	1,800	3,020	23,300	2,890	2,390	21,500	4,550	2,630	2,410
16.....	2,360	4,230	1,610	1,890	2,420	24,000	3,150	2,420	23,700	7,410	3,470	2,190
17.....	2,160	3,180	1,670	1,190	1,990	21,400	4,620	2,440	26,900	6,470	2,860	2,330
18.....	1,000	2,910	2,050	1,630	2,740	17,700	3,650	2,860	26,100	10,500	2,960	2,170
19.....	3,000	2,230	865	1,410	3,580	14,300	2,360	3,250	22,700	11,000	2,830	526
20.....	3,670	2,280	1,510	1,560	2,810	11,200	2,420	3,260	20,800	12,200	2,260	1,960
21.....	3,710	1,630	1,750	1,590	1,830	9,520	3,180	3,880	26,400	10,300	2,700	1,540
22.....	3,680	582	1,540	1,390	2,670	7,930	2,930	3,410	31,700	8,610	2,250	1,400
23.....	3,090	2,470	1,400	1,640	4,000	7,530	2,900	2,950	31,200	7,900	3,260	1,190
24.....	2,720	1,440	1,710	1,080	4,260	7,720	3,310	2,660	26,400	8,250	2,610	1,500
25.....	960	1,840	1,440	1,500	3,650	6,650	3,120	3,310	24,800	8,900	2,380	1,380
26.....	2,610	1,610	1,100	1,320	4,640	4,420	2,050	2,760	26,300	8,320	2,120	1,000
27.....	1,800	1,610	1,790	1,340	4,500	4,160	1,780	1,620	25,800	9,400	2,160	1,500
28.....	1,850	1,960	1,580	2,100	3,510	3,610	2,780	2,810	25,500	7,200	3,380	1,730
29.....	1,410	930	1,720	2,880	4,690	4,020	2,260	.....	24,500	6,200	1,050	1,880
30.....	1,850	1,660	2,010	2,480	2,640	4,080	1,640	.....	22,000	6,100	1,170	2,020
31.....	1,540	1,970	.....	962	.....	4,380	2,320	.....	20,700	.....	1,860	.....

NOTE.—Discharge for part of day estimated November 27, December 13, March 28, 29, 30, April 3, 4, 5, 27, 28, May 2, June 26, 27.

Monthly discharge of HUDSON RIVER AT SPIER FALLS, for the year ending June 30, 1921

(Drainage area, 2,777 square miles)

MONTH	DISCHARGE IN SECOND-FEET				RUN-OFF
	Maximum	Minimum	Mean	Per square mile	Depth in inches on drainage area
July.....	3,710	335	2,220	.793	.91
August.....	4,230	582	2,040	.729	.84
September.....	2,100	638	1,610	.575	.64
October.....	6,550	962	2,260	.807	.93
November.....	4,690	1,470	3,090	1.10	1.23
December.....	24,000	3,130	9,410	3.36	3.87
January.....	5,310	1,640	3,280	1.17	1.35
February.....	3,880	1,590	2,630	.939	.98
March.....	31,700	2,660	18,600	6.64	7.66
April.....	17,500	4,550	9,480	3.39	3.78
May.....	10,000	1,050	4,250	1.52	1.75
June.....	2,680	526	1,640	.586	.65
The year.....	31,700	335	5,080	1.81	24.59

NOTE.—The monthly discharge in second-feet per square mile and run-off in depth in inches shown by the table do not necessarily represent the natural flow from the basin because of artificial storage. The yearly discharge and run-off doubtless represent very nearly the natural flow.

HUDSON RIVER AT GLENS FALLS

Gage No. 127

Location.—Above the Feeder dam, about $1\frac{1}{2}$ miles west of Glens Falls.

Records available.—March 9, 1905, to June 30, 1921.

Gage.—Staff on crib, near left bank, about 500 feet above dam. Read by Mr. A. B. Fisher.

Discharge.—No discharge obtained.

Accuracy.—Gage read twice daily to tenths.

Coöperation.—Station established and maintained by this Department.

Daily elevation of water-surface (B. C. datum) of HUDSON RIVER ABOVE FEEDER DAM AT GLENS FALLS, for the year ended June 30, 1921

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	283.2	283.2	284.25	285.2	283.1	283.15	283.55	281.7	282.85	286.15	284.55	282.55
2.....	282.7	284.1	284.1	286.0	283.05	284.85	283.8	282.35	283.3	285.95	285.0	283.1
3.....	283.9	283.55	283.95	285.75	285.05	286.6	284.55	282.25	283.55	285.7	284.9	283.6
4.....	284.25	283.1	283.15	285.65	285.1	286.55	284.7	282.5	284.15	285.65	285.0	283.7
5.....	283.35	282.75	282.3	285.05	285.3	286.40	284.85	282.8	284.25	285.9	284.8	282.3
6.....	282.1	283.15	282.0	284.65	285.25	286.75	284.75	283.0	284.45	285.65	284.35	282.7
7.....	283.25	283.15	282.15	283.85	284.5	287.30	284.25	283.15	284.95	285.6	284.25	283.7
8.....	283.25	283.45	282.95	284.65	285.35	287.05	283.75	283.35	285.8	285.25	283.5	282.7
9.....	284.7	284.55	282.95	284.8	284.6	286.7	283.7	282.95	286.25	285.0	283.8	282.25
10.....	284.15	284.05	282.95	284.8	284.1	286.45	283.75	282.7	287.3	284.7	283.15	282.0
11.....	284.45	284.15	283.05	284.85	285.15	286.3	283.9	283.45	287.4	284.9	282.9	282.1
12.....	285.45	284.45	283.45	284.25	284.85	285.9	283.0	283.5	287.8	284.7	283.6	282.1
13.....	283.55	285.5	284.0	283.85	284.75	285.9	283.0	282.5	287.6	284.7	283.55	283.35
14.....	283.05	284.9	284.6	283.85	283.25	285.85	283.3	283.45	287.65	284.55	284.5	284.75
15.....	283.8	283.25	284.45	283.95	285.55	288.15	283.4	283.15	287.4	283.9	284.6	283.65

Daily elevation of water-surface (B. C. datum) of HUDSON RIVER ABOVE FEEDER DAM AT GLENS FALLS, for the year ended June 30, 1921 — *Continued*

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
16.....	283.25	285.15	283.35	283.65	285.0	288.05	283.6	283.0	287.65	284.45	285.35	283.05
17.....	283.3	284.25	283.4	283.45	283.85	287.75	284.85	283.25	287.95	284.1	284.4	283.4
18.....	283.3	283.7	283.7	283.7	284.3	287.8	283.95	283.4	287.85	284.9	284.0	284.2
19.....	284.55	282.65	283.35	283.25	285.1	286.75	282.65	283.8	287.4	285.15	283.85	281.05
20.....	284.35	283.2	284.3	282.4	283.55	286.25	282.85	284.0	287.05	285.6	283.8	281.65
21.....	284.45	283.55	284.15	283.55	283.6	286.15	283.5	284.25	287.65	284.85	282.5	283.6
22.....	284.25	282.35	283.8	283.05	284.6	285.5	283.25	283.85	288.2	284.65	284.2	283.7
23.....	283.6	283.7	283.45	283.15	283.9	285.4	282.55	283.35	287.95	284.7	284.8	283.35
24.....	283.35	284.4	283.75	284.00	284.55	285.35	283.65	283.45	287.45	284.65	284.3	283.2
25.....	283.2	284.25	283.75	283.55	285.5	285.25	283.65	283.5	287.25	284.95	283.15	283.25
26.....	284.3	283.75	283.5	283.65	285.75	284.4	283.0	283.4	287.35	284.55	282.85	283.4
27.....	284.3	283.55	284.65	283.5	285.55	283.9	282.15	282.3	287.35	285.1	282.8	284.65
28.....	283.25	283.55	284.1	284.15	284.85	283.25	283.25	283.3	287.3	284.5	283.4	283.7
29.....	282.55	283.25	283.95	285.25	285.65	283.45	282.35	.....	287.2	284.05	283.45	283.75
30.....	283.0	284.0	284.6	284.95	283.85	284.15	282.0	.....	286.95	284.1	282.25	284.25
31.....	283.4	283.85	.....	283.65	.....	283.8	281.8	.....	286.75	.....	282.15	.....

FEEDER CANAL AT GLENS FALLS

Location.—Slope station at upper end of Feeder canal at Glens Falls, Warren county. Three recording gages determine the slope from point of intake from Hudson river at Feeder dam to near the first lock below, known as lock No. 13. There is some slight diversion between the gages when the water surface exceeds the limits set by spillways located from place to place along the canal for safety marks, also some seepage due to leakage, largely in the riverside bank of the canal.

Records available.—Occasional discharge measurements made at various times from 1895 to 1918; continuous record, May 17, 1919, to June 30, 1921, when operation of these stations was assumed by State Engineer and Surveyor.

Gages.—Three Gurley 7-day water-stage recorders with 1:2 scale for gage heights. Float wells are 1½ feet by 2 feet, inside dimensions; the bottoms are sufficiently below the average elevation of water surface in the canal to allow for normal fluctuations.

Gage No. 1.—On right bank, about 300 feet below the point of diversion at Feeder dam.

Gage No. 2.—On left bank, about 3.4 miles downstream from gage No. 1 and 1,000 feet below the plant of the Glens Falls Portland Cement Company.

Gage No. 3.—Beginning with the canal season of 1920, a third gage was operated about 2.3 miles below gage No. 2. It is on the right bank, in the protection of a small bayou, about 2,000 feet above lock No. 13.

Discharge measurements.—Made from the first change bridge, about 2,000 feet below gage No. 1; from the highway bridge, 300

feet above gage No. 2 and from the highway bridge about 1,000 feet above gage No. 3.

Determination of discharge.—Daily discharge determined by use of Chezy formula. The coefficient is computed from each current meter measurement and plotted on a curve showing the variation of "C" through the season. A smooth curve is then drawn through the plotted points and coefficient for each day is taken off. The other factors in the Chezy formula are obtained from gage height records.

Regulation.—Regulation of flow in Feeder canal is determined by demands of Champlain canal and by water required for floating logs from the Hudson river to the several mills along the feeder.

Ice.—Usually the feeder is emptied at the end of the canal season and any flow during the winter months is from natural seepage.

Accuracy.—The values of the coefficient of Chezy formula determined from current meter measurements are consistent. Daily discharge ascertained as indicated in paragraph under "Determination of Discharge." Results generally good, except for periods of faulty operation of one or more of the three gages, when results are, at best, fair.

Coöperation.—Station established and maintained by the United States Geological Survey in coöperation with the State Engineer and Surveyor.

Discharge measurements of FEEDER CANAL AT GLENS FALLS AT FIRST CHANGE BRIDGE BELOW GAGE No. 1, during the year ending June 30, 1921

DATE	Made by	GAGE HEIGHT		Discharge <i>Sec.-ft.</i>
		Gage 1	Gage 2	
		<i>Feet</i>	<i>Feet</i>	
July 7	Currier and Shupe	281.632	280.38	216
July 25	E. B. Shupe	281.925	280.492	219
Aug. 26	S. M. Currier	282.404	280.56	268
Sept. 5	B. F. Howe	281.942	280.144	240
Sept. 6	B. F. Howe	281.755	280.247	191
Sept. 9	a Monaskey, Davison and Sennett	282.32	280.28	b 325
Sept. 15	a Davison and Monaskey	282.21	280.41	265
Sept. 20	a Davison and Sennett	282.02	280.51	221
Sept. 21	a A. H. Davison	282.10	280.54	256
Sept. 23	a Davison and Sennett	282.11	280.43	260
Sept. 27	a A. H. Davison	282.21	280.56	263
Oct. 7	V. B. Lamoureux	282.30	280.86	256
Oct. 18	a Davison and Sheehy	282.07	280.60	279
Oct. 26	S. M. Currier	281.878	280.390	288
Nov. 9	a A. H. Davison	281.76	280.44	284
June 22	C. C. Covert	281.37	280.24	209

a Employee of International Paper Co.

b Measurement made in lock above gage No. 1; Fteley meter used.

Discharge measurements of FEEDER CANAL AT GLENS FALLS AT FIRST HIGHWAY
BRIDGE, 800 FEET ABOVE GAGE No. 2, during the year ending Sept. 30, 1921

DATE	Made by	GAGE HEIGHT		Discharge
		Gage 2	Gage 3	
		<i>Feet</i>	<i>Feet</i>	<i>Sec.-ft.</i>
July 7	Currier and Shupe	280.424	279.84	192
July 25	E. B. Shupe	280.425	279.705	164
Aug. 26	S. M. Currier	280.532	279.528	189
Sept. 5	B. F. Howe	280.224	279.234	154
Sept. 15	aDavison and Monackey	280.37	278.862	180
Sept. 20	aDavison and Sennett	280.50	279.29	181
Sept. 21	aA. H. Davison	280.52	279.42	201
Sept. 22	A. H. Davison	280.49	279.27	196
Sept. 23	A. H. Davison	280.43	279.26	198
Sept. 24	A. H. Davison	280.58	279.61	169
Sept. 27	A. H. Davison	280.52	279.385	204
Oct. 1	A. H. Davison	280.64	279.55	222
Oct. 7	V. B. Lamoureux	280.55	279.80	219
Oct. 7	S. M. Currier	280.86	280.17	214
Oct. 26	S. M. Currier	280.375	279.645	226
Nov. 9	aA. H. Davison	280.43	b 279.65	234
Nov. 10	A. H. Davison	280.24	279.68	216
June 22	Shupe and Covert	280.38	279.95	176

a Employee of International Paper Co.

b Estimated.

Discharge measurements of FEEDER CANAL AT GLENS FALLS AT FERRY STREET
BRIDGE, HUDSON FALLS, ABOUT 1,000 FEET ABOVE GAGE No. 3, during the year
ending June 30, 1921

DATE	Made by	GAGE HEIGHT		Discharge
		Gage 2	Gage 3	
		<i>Feet</i>	<i>Feet</i>	<i>Sec.-ft.</i>
July 8	Shupe and Currier	280.30	279.695	173
July 25	E. B. Shupe	280.365	279.61	160
Aug. 27	S. M. Currier	280.40	279.33	126
Sept. 4	B. F. Howe	280.544	279.445	155
Sept. 20	aDavison and Sennett	280.44	279.24	173
Sept. 22	Davison and Sennett	280.42	279.11	175
Sept. 24	Davison and Sennett	280.66	279.77	164
Oct. 1	aA. H. Davison	280.58	279.50	193
Oct. 7	S. M. Currier	280.58	279.91	170
Oct. 26	S. M. Currier	280.35	279.62	202
Nov. 10	aA. H. Davison	280.20	279.64	199
June 22	E. B. Shupe	280.26	279.69	147

a Employee of International Paper Co.

Daily discharge, in second-feet, of FEEDER CANAL AT GLENS FALLS (GAGE No. 1),
for the year ending June 30, 1921

DAY	July	Aug.	Sept.	Oct.	Nov.	May	June
1.....	261	235	240	265	271	.....	194
2.....	261	240	240	229	272	.....	202
3.....	255	244	240	259	279	.....	202
4.....	245	225	240	262	273	.....	195
5.....	241	220	225	264	279	.....	191
6.....	242	229	210	262	286	.....	207
7.....	239	225	216	269	277	.....	203
8.....	242	233	234	277	284	263	201
9.....	258	244	243	291	281	277	202
10.....	251	234	246	276	272	267	205
11.....	243	231	250	279	278	282	207
12.....	252	232	261	280	283	259	207
13.....	248	237	259	278	285	261	208
14.....	247	235	259	285	200	237	209
15.....	244	235	251	279	75	217	208
16.....	232	242	243	283	48	209	209
17.....	251	245	246	281	55	202	209
18.....	246	238	255	278	110	199	212
19.....	252	235	240	275	140	196	159
20.....	243	242	241	278	140	197	195
21.....	243	246	245	282	.....	192	213
22.....	238	227	251	281	.....	190	208
23.....	230	241	245	278	.....	195	206
24.....	228	242	250	299	.....	206	209
25.....	221	241	265	287	.....	204	217
26.....	237	241	264	282	.....	198	201
27.....	231	243	265	280	.....	191	223
28.....	237	238	256	272	.....	201	217
29.....	226	236	260	268	.....	181	219
30.....	234	239	256	264	.....	176	209
31.....	237	239	.....	278	.....	188	.....

NOTE.— Discharge for following days when gage-height record was interrupted, estimated from gage-height and discharge hydrographs, recorder graph and study of slope relation: July 1, 2, 30, 31, August 6, 20, 21, September 3, 4, October 14, 15, 21, 22, 28, November 14 to 20, May 12 to 28, 31, June 1, 9 to 11, 16 to 22.

Daily discharge, in second-feet, of FEEDER CANAL AT GLENS FALLS (GAGE No. 2),
for the year ending June 30, 1921

DAY	July	Aug.	Sept.	Oct.	Nov.	May	June
1.....	206	173	154	212	223	.....	135
2.....	216	169	155	213	222	.....	150
3.....	194	175	150	209	232	.....	157
4.....	176	157	150	212	225	.....	154
5.....	166	158	143	207	233	.....	128
6.....	176	167	125	216	227	.....	149
7.....	180	154	146	204	220	.....	147
8.....	175	167	153	227	220	162	151
9.....	194	183	151	225	220	192	157
10.....	187	161	155	229	220	175	161
11.....	172	160	169	231	218	194	159
12.....	192	163	177	239	220	172	166
13.....	196	161	189	218	230	174	169
14.....	193	160	187	234	.....	159	170
15.....	187	167	177	251	.....	149	166
16.....	168	166	169	241	.....	149	169
17.....	194	168	177	249	.....	139	169
18.....	192	163	175	247	.....	138	176
19.....	194	162	156	231	.....	137	114
20.....	187	161	161	231	.....	136	188

Daily discharge, in second-feet, of FEEDER CANAL AT GLENS FALLS (GAGE No. 2),
for the year ending June 30, 1921 — *Continued*

DAY	July	Aug.	Sept.	Oct.	Nov.	May	June
21	183	158	175	237	.....	137	192
22	177	164	181	218	.....	133	181
23	174	160	177	244	.....	134	185
24	172	156	182	230	.....	141	188
25	164	157	190	227	.....	140	188
26	173	155	194	226	.....	134	179
27	185	154	198	230	.....	133	193
28	179	147	204	226	.....	136	200
29	169	142	207	226	.....	124	190
30	163	152	205	218	.....	124	190
31	158	157	.....	221	.....	129	.....

NOTE.— Discharge for following days when gage-height record was interrupted, estimated from gage-height and discharge hydrographs, recorder graph and study of slope relation: July 1, 2, 30, 31, August 6, 20, 21, September 3, 4, October 1, 2, 14, 15, 21, 22, 28, November 7 to 10, 12, 13, May 12 to 28, 31, June 1, 3, 4, 9 to 11, 16 to 22.

Daily discharge, in second-feet, of FEEDER CANAL AT GLENS FALLS (GAGE No. 3),
for the year ending June 30, 1921

DAY	July	Aug.	Sept.	Oct.	Nov.	May	June
1	192	165	140	189	195	.....	127
2	193	165	138	191	199	.....	141
3	184	163	136	191	208	.....	147
4	168	155	136	191	200	.....	144
5	164	151	127	194	203	.....	122
6	167	163	119	196	204	.....	141
7	171	151	119	192	198	.....	139
8	171	156	137	202	201	144	141
9	180	154	140	199	206	162	145
10	179	153	143	200	197	151	148
11	172	150	148	202	197	169	149
12	178	152	152	206	200	152	152
13	183	147	158	202	210	154	155
14	183	146	157	210	.....	144	155
15	177	145	157	219	.....	138	152
16	168	148	153	218	.....	138	157
17	182	141	160	220	.....	130	158
18	184	138	161	221	.....	128	162
19	182	134	155	205	.....	129	106
20	178	139	160	201	.....	127	150
21	177	140	164	214	.....	126	172
22	173	126	171	198	.....	125	163
23	170	136	171	215	.....	126	167
24	168	138	172	202	.....	132	168
25	159	139	173	203	.....	131	166
26	167	138	178	202	.....	126	160
27	174	138	183	206	.....	125	174
28	171	130	180	201	.....	128	178
29	161	133	179	204	.....	117	171
30	160	136	190	196	.....	116	171
31	158	140	.....	196	.....	117	.....

NOTE.— Discharge for following days when gage-height record was interrupted, estimated from gage-height and discharge hydrographs, recorder graph and study of slope relation: July 1, 2, 30, 31, August 6, 20, 21, September 3, 4, October 1, 2, 14, 15, 21, 22, 28, November 7 to 10, 12, 13, May 12 to 28, 31, June 1, 3, 4, 9 to 11, 16 to 22.

Monthly discharge of FEEDER CANAL AT GLENS FALLS (GAGE No. 1), for the year ending June 30, 1921

MONTH	DISCHARGE IN SECOND-FEET		
	Maximum	Minimum	Mean
July.....	261	221	242
August.....	246	220	237
September.....	265	210	247
October.....	299	229	275
November 1 to 20.....	286	48	219
May 8 to 31.....	282	176	216
June.....	223	159	205

Monthly discharge of FEEDER CANAL AT GLENS FALLS (GAGE No. 2), for the year ending June 30, 1921

MONTH	DISCHARGE IN SECOND-FEET		
	Maximum	Minimum	Mean
July.....	216	158	182
August.....	183	142	161
September.....	207	125	171
October.....	251	204	227
November 1 to 13.....	233	218	224
May 8 to 31.....	194	124	148
June.....	200	114	167

Monthly discharge of FEEDER CANAL AT GLENS FALLS (GAGE No. 3), for the year ending June 30, 1921

MONTH	DISCHARGE IN SECOND-FEET		
	Maximum	Minimum	Mean
July.....	193	158	174
August.....	165	126	145
September.....	190	119	155
October.....	221	189	203
November 1 to 13.....	210	195	201
May 8 to 31.....	169	116	135
June.....	178	106	153

HUDSON RIVER AT FORT EDWARD

Gage No. 119

Location.—Below lock No. 7, in the village of Fort Edward.

Records available.—April 11, 1904, to June 30, 1921.

Gage.—Staff in two sections on the east wall below the lock.

Discharge.—No discharge obtained.

Accuracy.—Gage read twice daily to half-tenths.

Coöperation.—Station established by this Department. Gage read by employees of the Department of Public Works.

Daily elevation of water-surface (B. C. datum) of HUDSON RIVER BELOW LOCK NO. 7 AT FORT EDWARD, for the year ended June 30, 1921

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	119.50	120.65	120.70	121.85	120.70	121.10	a	120.75	121.15	124.8	122.2	120.45
2.....	119.95	120.80	120.75	122.20	120.75	121.70	a	120.85	120.9	124.15	122.8	120.5
3.....	120.33	120.35	120.90	121.85	120.95	122.35	121.65	120.8	121.25	a	122.65	120.4
4.....	121.15	120.85	120.90	121.70	121.05	122.45	121.85	120.65	121.35	123.1	122.6	120.6
5.....	120.85	120.80	120.75	121.55	121.35	122.45	121.7	120.85	121.2	123.25	122.35	120.5
6.....	120.60	120.70	120.75	121.32	121.30	123.55	121.65	a	a	123.1	122.25	120.35
7.....	120.60	120.73	120.55	120.85	121.10	123.65	121.55	120.8	121.8	122.6	121.9	120.35
8.....	121.00	120.48	120.70	120.85	121.10	123.40	121.5	121.25	122.35	122.7	121.8	120.5
9.....	120.88	120.55	120.68	120.80	121.10	122.75	a	120.9	123.2	123.1	121.5	120.45
10.....	121.00	120.80	120.70	120.75	121.10	122.40	121.55	120.8	124.6	a	121.4	120.45
11.....	120.63	120.80	120.70	120.55	121.15	122.25	121.15	120.7	124.8	122.65	121.0	120.3
12.....	120.60	120.75	120.45	120.75	121.30	122.05	121.0	120.8	125.6	121.95	121.0	120.35
13.....	121.15	121.00	120.70	120.75	121.40	121.85	120.9	a	a	121.95	120.95	120.6
14.....	120.95	121.30	120.85	120.75	121.10	121.75	120.75	120.85	125.5	121.5	121.0	120.5
15.....	121.10	121.05	121.00	120.75	120.50	125.95	120.85	120.95	124.55	121.4	120.85	120.35
16.....	120.45	121.30	120.95	120.75	120.90	126.00	a	120.8	124.7	121.9	120.8	120.75
17.....	120.30	121.35	120.90	120.55	121.00	125.50	121.6	120.85	126.3	a	120.8	120.75
18.....	120.35	121.20	120.70	120.65	120.90	124.80	121.2	121.0	126.2	122.45	120.95	120.7
19.....	120.70	120.75	120.55	120.75	120.85	123.95	120.8	121.15	125.7	122.85	120.95	120.75
20.....	121.35	120.85	120.45	120.80	121.00	123.30	120.9	a	a	122.15	120.85	120.35
21.....	121.35	120.65	120.70	120.68	121.10	122.35	120.9	121.0	125.75	122.05	120.8	120.1
22.....	121.33	120.50	120.75	120.65	120.85	122.45	120.8	a	127.1	121.9	120.65	120.25
23.....	121.40	120.50	120.65	120.65	121.20	122.30	120.6	121.1	127.1	121.8	120.8	120.4
24.....	121.10	120.75	120.75	120.65	121.75	122.45	121.3	121.35	126.8	a	121.05	120.3
25.....	120.85	120.70	120.65	120.60	121.55	a	121.2	120.8	126.1	122.65	120.95	120.45
26.....	120.60	120.75	120.55	120.75	121.65	a	120.8	120.95	126.4	122.15	120.8	120.3
27.....	120.90	120.75	120.35	120.70	121.45	121.55	120.65	a	126.0	122.45	120.65	120.15
28.....	120.90	120.68	120.65	120.70	121.30	121.10	120.75	120.8	126.3	122.0	120.75	120.35
29.....	120.75	120.70	120.60	120.65	121.65	121.25	120.7	.....	125.7	122.0	120.8	120.5
30.....	120.55	120.50	120.80	121.05	121.50	121.25	a	.....	125.2	121.65	120.45	120.5
31.....	120.80	120.70	.....	120.82	.....	121.35	120.75	.....	124.8	.....	120.45	.....

a No record.

HUDSON RIVER AT CROCKER'S REEF DAM

Gage No. 118

Location.—At Crocker's Reef dam, about 6 miles below Fort Edward.

Records available.—Discharge, September 1, 1907, to June 30, 1918. Water-surface elevations, April 11, 1904, to June 30, 1921.

Gage.—Staff on the east side of the north end of the pier at the guard-gate. Read by Mr. J. H. Donnelly.

Discharge.—No discharge obtained.

Accuracy.—Gage read twice daily to tenths.

Coöperation.— Station established and maintained by this Department.

Daily elevation of water-surface (B. C. datum) of HUDSON RIVER ABOVE CROCKER'S REEF DAM, for the year ended June 30, 1921

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	120.65	120.9	121.05	120.95	121.0	121.5	120.95	120.65	121.0	123.65	122.0	120.5
2.....	120.8	120.75	120.9	121.4	120.9	122.0	121.1	120.6	120.95	123.35	122.3	120.5
3.....	121.0	121.0	120.35	120.65	121.15	122.2	121.65	120.65	121.1	123.05	122.15	120.5
4.....	121.15	120.6	120.9	121.1	121.0	122.5	121.5	120.6	121.15	122.5	122.25	120.6
5.....	120.65	120.8	120.45	120.9	121.1	122.5	121.45	120.7	121.05	122.7	122.05	120.45
6.....	121.0	120.9	120.9	120.5	121.3	123.1	121.45	121.05	121.05	122.45	121.95	120.35
7.....	120.8	121.05	120.8	120.6	121.0	123.05	121.1	120.65	121.55	122.3	121.75	120.3
8.....	121.35	120.6	120.8	120.65	120.95	122.65	120.95	120.95	121.95	122.15	121.45	120.4
9.....	120.6	120.9	120.65	120.9	120.9	122.15	120.95	120.6	122.4	122.45	121.35	120.4
10.....	120.95	120.95	121.0	120.6	121.0	122.0	121.15	120.6	123.6	121.7	121.0	120.25
11.....	121.1	121.05	120.9	120.5	120.85	121.75	121.0	120.7	123.7	122.05	120.95	120.25
12.....	120.8	120.9	120.9	120.9	121.0	121.45	121.0	120.9	124.15	121.75	120.95	120.25
13.....	121.1	121.1	120.85	120.5	121.1	121.4	120.75	120.6	124.1	121.9	120.7	120.3
14.....	120.9	120.9	120.8	120.5	121.1	121.95	120.75	120.6	124.2	121.5	120.85	120.4
15.....	120.6	120.95	120.85	121.0	120.9	124.7	120.95	120.65	124.2	121.15	120.8	120.7
16.....	120.9	120.8	120.5	120.65	120.9	124.65	120.9	120.7	124.2	121.6	120.85	120.6
17.....	121.1	121.0	120.85	120.7	121.0	124.3	121.15	120.7	124.75	121.45	120.9	120.5
18.....	120.9	121.1	120.9	120.85	120.55	123.75	121.0	120.8	124.7	122.0	120.85	120.65
19.....	120.95	120.9	121.1	120.25	120.7	123.05	120.9	120.9	124.3	122.7	120.85	120.45
20.....	120.9	120.6	120.75	120.85	120.9	122.7	120.75	120.6	123.9	122.8	120.8	120.3
21.....	121.25	120.9	120.6	121.0	121.0	122.15	120.7	120.95	124.3	122.25	120.6	120.2
22.....	121.0	120.85	121.0	120.5	121.3	122.0	120.7	121.0	125.4	122.3	120.55	120.35
23.....	121.3	121.1	120.85	120.6	121.1	121.95	120.7	120.8	125.5	121.8	120.6	121.25
24.....	120.9	120.6	120.9	120.5	121.4	122.1	120.95	120.95	125.05	121.95	120.95	120.9
25.....	120.8	120.9	120.95	120.85	120.95	122.0	120.7	120.8	124.5	122.15	120.7	120.5
26.....	120.65	120.85	120.85	120.5	121.1	122.05	120.7	120.7	124.75	121.85	120.6	120.4
27.....	120.9	120.55	120.85	120.7	120.9	121.15	120.5	120.6	124.7	122.25	120.6	120.6
28.....	120.95	120.9	120.8	120.6	121.5	121.05	120.55	120.75	124.5	121.8	120.5	121.05
29.....	121.05	120.5	120.85	121.0	122.35	121.05	120.7	.....	124.65	121.6	120.55	121.15
30.....	120.7	121.0	120.5	120.5	121.0	121.05	120.8	.....	124.25	121.5	120.45	120.8
31.....	121.0	120.55	.....	120.65	.....	120.95	120.55	.....	124.0	.....	120.35	.....

HUDSON RIVER AT MECHANICVILLE

Gage No. 106

Location.— Above the dam of the West Virginia Pulp and Paper Company, in the village of Mechanicville.

Records available.— October 26, 1916, to June 30, 1921.

Gage.— Staff in two sections; lower section is on the nosing at the upper end of the east lock wall; upper section is on the face of the old abutment at the upper end of the east lock wall.

Discharge.— See Hudson river at Mechanicville, page 148.

Accuracy.— Gage read twice daily to hundredths.

Coöperation.— Station established by this Department. Gage read by employees of the Department of Public Works.

**Daily elevation of water-surface (B. C. datum) of HUDSON RIVER ABOVE DAM No. 3,
MECHANICVILLE, for the year ended June 30, 1921**

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	70.30	70.60	70.41	72.92	70.46	71.36	a	67.86	70.11	72.96	70.28	69.52
2.....	70.20	70.51	70.44	72.86	70.30	72.75	70.90	67.75	69.58	72.40	70.46	70.00
3.....	68.99	70.36	70.45	72.48	71.22	72.81	71.36	67.73	71.03	a	70.32	70.14
4.....	69.62	70.27	70.45	71.98	71.80	72.70	70.66	68.30	71.16	70.86	70.08	68.58
5.....	71.33	70.14	70.70	71.58	71.67	73.22	70.33	69.20	70.75	71.04	70.04	67.75
6.....	70.35	69.99	70.52	71.66	71.75	74.10	70.24	a	a	70.70	69.78	70.95
7.....	69.32	69.38	69.25	70.95	71.71	73.37	70.74	69.00	70.45	70.80	70.02	70.42
8.....	69.81	69.24	69.43	70.46	70.80	72.80	70.85	68.52	70.58	a	69.75	69.35
9.....	70.40	68.58	70.15	70.70	71.28	72.16	a	68.44	70.72	a	69.46	67.50
10.....	70.58	67.92	70.12	70.76	71.16	71.90	70.60	68.36	72.76	a	68.96	70.88
11.....	70.54	70.45	70.35	70.15	71.22	71.68	69.33	69.35	72.47	70.3	68.73	70.84
12.....	69.98	70.51	70.42	70.25	71.24	71.60	69.38	70.09	72.31	69.82	68.56	70.85
13.....	70.60	70.25	70.22	70.37	71.37	71.12	69.26	a	a	69.72	68.46	70.32
14.....	70.41	70.83	70.20	70.34	71.58	71.06	70.00	67.40	72.37	69.84	69.0	70.22
15.....	70.45	71.00	70.26	70.24	70.08	74.38	70.80	68.50	71.96	69.70	69.16	70.71
16.....	70.41	71.11	70.56	70.26	70.94	73.82	a	68.05	72.00	69.78	68.30	70.22
17.....	69.97	71.38	70.13	67.80	71.04	73.54	70.45	69.95	72.46	a	68.54	69.94
18.....	70.30	70.89	70.35	70.08	71.00	73.22	69.85	70.70	72.86	69.94	68.30	70.18
19.....	70.45	70.70	69.40	70.22	70.90	a	69.50	70.30	72.42	70.82	68.30	70.96
20.....	70.35	70.22	70.11	70.19	71.46	72.22	67.90	a	a	70.40	68.40	70.22
21.....	70.50	70.30	70.24	70.20	71.22	71.46	69.84	69.33	72.16	70.68	68.62	67.61
22.....	70.40	70.35	70.23	70.25	70.14	71.31	70.46	68.75	72.86	70.89	68.59	67.91
23.....	70.50	69.25	70.28	69.88	71.86	71.16	a	68.36	72.95	70.09	67.28	68.28
24.....	70.40	70.47	70.27	67.14	73.11	71.32	70.06	68.90	72.97	a	68.10	68.66
25.....	69.90	70.39	69.95	68.15	72.16	a	68.22	69.80	72.52	70.20	67.16	67.36
26.....	70.20	70.35	67.22	70.36	71.98	71.42	67.56	70.09	72.69	69.60	67.44	68.92
27.....	70.40	70.35	69.81	70.06	71.92	70.70	67.30	a	a	69.97	69.11	70.32
28.....	70.15	70.25	70.23	70.42	71.96	70.46	67.33	67.92	72.32	70.16	71.20	70.12
29.....	70.40	70.52	70.50	70.34	71.81	69.42	69.00	.....	72.51	69.70	71.46	70.32
30.....	70.00	70.33	70.24	70.84	71.75	69.85	a	.....	72.00	69.88	71.17	70.65
31.....	69.85	70.17	.....	71.48	.....	70.70	67.36	.....	71.66	.....	70.42	.....

a No record.

HUDSON RIVER AT MECHANICVILLE

Gage No. 105

Location.—Below the dam of the West Virginia Pulp and Paper Company, in the village of Mechanicville.

Records available.—October 26, 1916, to June 30, 1921.

Gage.—Staff in two sections; lower section is on the nosing at the lower end of the east wall of the lock; upper section is on the lower end of the east thrust wall of the lock.

Discharge.—See Hudson river at Mechanicville, page 148.

Accuracy.—Gage read twice daily to hundredths.

Coöperation.—Station established by this Department. Gage read by employees of the Department of Public Works.

Daily elevation of water-surface (B. C. datum) of HUDSON RIVER BELOW DAM NO. 3, MECHANICVILLE, for the year ended June 30, 1921

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	48.11	47.91	47.86	51.70	48.03	49.45	a	48.50	49.42	54.55	50.42	47.90
2.....	48.03	47.85	47.83	51.32	48.08	51.44	49.80	47.96	49.52	53.36	51.20	48.08
3.....	47.81	48.07	47.95	50.44	48.96	51.35	50.34	48.20	49.95	a	50.76	48.12
4.....	47.70	48.01	47.88	50.13	50.08	51.22	50.11	47.84	49.76	51.58	50.76	48.14
5.....	48.17	48.14	47.87	49.85	49.80	51.60	49.92	48.18	49.44	51.86	50.60	47.62
6.....	48.00	47.96	47.74	49.68	49.50	54.28	49.84	a	a	51.18	50.35	48.06
7.....	47.99	47.80	47.75	48.87	48.95	53.12	49.62	48.82	50.56	50.76	49.97	47.89
8.....	48.01	47.79	47.63	48.18	48.36	52.24	49.50	48.64	50.96	a	49.48	47.96
9.....	48.11	47.71	47.68	48.26	49.18	51.50	a	48.66	51.72	a	49.50	47.95
10.....	48.14	47.93	47.88	48.06	48.82	51.20	49.06	48.50	54.16	a	49.26	48.00
11.....	47.93	48.38	47.84	48.06	48.86	51.08	49.22	48.52	53.40	50.70	49.09	47.94
12.....	48.02	48.50	48.10	48.04	48.99	50.30	48.96	48.69	53.28	50.26	49.04	47.87
13.....	48.29	48.43	47.92	48.11	49.40	51.30	49.34	a	a	50.30	48.52	48.02
14.....	48.25	49.06	48.00	48.10	48.98	50.14	49.11	48.28	53.85	49.69	48.79	48.00
15.....	48.16	48.57	47.95	48.24	48.06	54.52	49.11	48.50	53.34	49.46	48.62	48.08
16.....	48.22	49.30	48.20	48.20	48.92	54.16	a	48.00	53.54	49.66	48.64	48.09
17.....	48.20	49.50	47.92	48.01	48.78	53.24	49.57	48.58	54.16	a	49.05	47.98
18.....	47.85	49.06	47.85	47.89	48.90	52.88	49.57	49.90	54.12	50.62	48.82	48.02
19.....	47.83	48.59	47.85	48.06	48.70	a	49.00	49.15	53.35	51.78	48.82	48.00
20.....	48.37	48.35	47.84	48.14	49.38	51.40	48.50	a	a	50.66	48.26	48.05
21.....	48.60	48.21	47.75	47.95	48.58	50.68	48.38	49.35	53.42	51.0	48.04	47.90
22.....	48.70	47.75	47.80	48.06	48.16	50.81	49.08	49.22	54.64	50.8	48.02	47.88
23.....	48.75	47.56	47.80	47.95	49.80	50.81	a	48.80	54.86	49.79	48.18	48.06
24.....	48.30	48.02	47.79	48.02	51.85	51.04	49.00	47.86	54.32	a	48.69	47.86
25.....	47.90	47.95	48.00	47.72	50.54	a	49.28	48.45	53.52	50.6	48.30	47.82
26.....	48.00	47.85	48.16	47.98	50.12	51.20	48.29	48.35	53.94	49.85	48.24	47.83
27.....	48.25	48.20	47.71	47.95	49.97	50.10	48.02	a	a	50.50	48.02	47.98
28.....	47.95	47.83	47.86	48.02	49.34	49.39	47.90	48.24	53.76	49.98	48.06	47.95
29.....	48.10	47.63	48.08	48.06	49.80	49.55	48.42	a	54.06	49.76	48.12	48.11
30.....	48.00	48.00	47.97	48.42	49.97	49.94	a	.....	53.52	49.82	47.94	48.29
31.....	48.05	47.94	.....	48.39	.....	49.78	49.08	.....	52.89	.....	48.02	.....

a No record.

HUDSON RIVER AT MECHANICVILLE

Location.—At Duncan dam of West Virginia Pulp and Paper Company, in Mechanicville, Saratoga county, 3,700 feet above mouth of Anthony kill, $1\frac{1}{4}$ miles below mouth of Hoosic river and about 19 miles above mouth of Mohawk river.

Drainage area.—4,500 square miles.

Records available.—1888 to June 30, 1921.

Gage.—Water-stage recorder at the dam, installed in 1910; previous to that date, staff gage.

Computations of discharge.—Discharge over spillway determined from a rating curve based on coefficients derived by United States Geological Survey for dams of ogee section. Discharge through turbines computed from records of their operation. Discharge at lock and through Barge canal turbines at lock computed from records of the number of lockages per day.

Extremes of discharge.—Maximum daily discharge during year, 33,000 second-feet, March 22; minimum daily discharge, 715 second-feet, June 26.

1888-1921: Maximum discharge recorded, 120,000 second-feet at 6 A. M., March 28, 1913. The plant is occasionally shut down and the flow of the river stored in the pond so that the discharge below the station at these times becomes practically zero.

Diversions.—Water is diverted from Hudson river through the Glens Falls feeder and the old Champlain canal into the summit level of the Barge canal. A portion flows north into Lake Champlain. No correction has been made for this diversion.

Coöperation.—Discharge over the spillway and through turbines of the West Virginia Pulp and Paper Company furnished by Mr. W. J. Barnes, engineer of the company.

Daily discharge, in second-feet, of HUDSON RIVER AT MECHANICVILLE, for the year ending June 30, 1921

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1	2,290	1,550	1,920	15,400	2,600	7,910	6,120	3,280	6,440	29,500	12,600	2,020
2	1,990	2,380	2,040	12,900	2,760	13,900	7,410	2,950	6,370	24,100	13,600	2,200
3	1,730	2,920	2,250	8,880	7,140	13,600	9,010	3,080	7,990	20,400	11,900	2,600
4	2,480	2,670	2,410	8,020	7,220	12,900	8,320	2,270	6,760	16,700	11,800	2,680
5	2,680	2,440	1,400	6,460	6,820	18,600	8,070	3,000	5,750	16,300	10,900	1,210
6	2,330	1,990	1,240	6,180	5,620	21,500	5,170	5,080	14,900	10,200	1,940	
7	1,850	1,630	1,490	4,140	4,400	17,200	6,980	4,370	8,150	13,200	8,780	1,980
8	1,890	1,400	1,620	3,880	4,560	13,200	6,010	4,470	11,300	13,000	7,100	2,120
9	2,460	1,420	1,790	3,550	4,680	11,500	5,130	3,990	17,100	13,400	6,910	1,340
10	2,860	1,790	1,660	2,590	4,520	10,200	6,140	3,760	27,800	10,800	5,710	1,400
11	1,280	3,340	1,880	2,670	4,580	8,810	5,540	3,360	23,500	11,800	4,830	979
12	2,850	3,460	1,420	2,910	5,060	7,310	4,560	3,710	24,100	9,800	4,540	1,220
13	3,950	3,750	1,920	2,640	5,270	6,720	4,440	2,660	28,400	9,570	4,570	1,630
14	3,050	4,330	2,080	2,980	4,010	12,000	3,960	2,870	26,800	8,400	4,850	2,000
15	3,450	3,720	2,640	2,740	3,360	25,200	5,940	3,560	24,200	7,340	4,100	2,760
16	3,180	5,570	2,640	2,810	4,440	28,900	5,080	3,410	26,400	8,910	4,800	2,510
17	2,540	5,190	2,080	1,580	4,560	26,100	6,220	5,100	29,200	9,850	5,010	2,110
18	1,410	4,510	2,230	2,360	4,510	21,600	5,410	5,100	28,100	12,200	4,680	2,290
19	2,230	4,020	1,380	2,440	5,530	17,900	4,320	4,750	24,800	14,900	4,350	1,550
20	3,870	2,950	1,580	2,550	5,340	12,300	3,890	3,660	23,400	13,900	4,200	1,730
21	4,380	2,570	2,160	2,250	3,880	12,600	3,770	4,660	27,500	12,500	3,640	1,480
22	4,220	1,600	2,200	2,230	4,090	11,000	4,560	4,560	33,000	12,000	2,970	1,340
23	4,140	1,740	2,140	1,990	13,300	11,200	3,620	4,400	32,600	10,100	3,380	1,310
24	3,500	2,260	2,070	1,310	12,800	11,300	4,910	3,560	28,700	10,200	4,070	1,350
25	1,640	2,140	2,080	1,580	9,770	9,690	4,480	3,410	26,500	11,500	3,510	1,140
26	2,120	2,020	1,090	2,100	9,380	7,510	3,460	3,590	27,900	9,960	3,120	715
27	2,690	2,160	1,480	1,850	8,890	6,440	2,760	2,760	28,700	11,300	2,230	1,190
28	2,440	1,840	1,930	2,670	7,950	6,080	2,690	4,500	28,000	9,230	2,400	1,480
29	2,260	1,220	2,150	2,850	8,020	6,000	2,740	.....	28,100	7,940	2,740	1,880
30	1,920	2,110	4,100	3,920	6,920	6,440	2,200	.....	24,600	7,980	2,260	3,280
31	1,630	1,880	.....	2,900	.....	6,610	3,010	.....	23,700	.....	2,550	.....

Monthly discharge of HUDSON RIVER AT MECHANICVILLE, for the year ending June 30, 1921

[Drainage area, 4,500 square miles]

MONTH	DISCHARGE IN SECOND-FEET				RUN-OFF
	Maximum	Minimum	Mean	Per square mile	Depth in inches on drainage area
July	4,380	1,380	2,620	.582	.67
August	5,570	1,220	2,660	.591	.68
September	4,100	1,090	1,970	.438	.49
October	15,400	1,310	3,980	.884	1.02
November	13,300	2,600	6,070	1.35	1.51
December	28,900	6,000	13,000	2.89	3.33
January	9,010	2,200	5,110	1.14	1.31
February	5,170	2,270	3,780	.840	.87
March	33,000	5,080	21,500	4.78	5.51
April	29,500	7,340	12,700	2.82	3.15
May	13,600	2,230	5,750	1.28	1.48
June	3,280	715	1,780	.396	.44
The year	33,000	715	6,780	1.51	20.46

NOTE.—The monthly discharge in second-feet per square mile and run-off in depth in inches shown by the table do not necessarily represent the natural flow from the basin because of artificial storage. See "Diversions" above.

HUDSON RIVER BELOW MECHANICVILLE

Gage No. 104

Location.—Above dam of the Adirondack Power and Light Corporation, about 2 miles below the village of Mechanicville.

Records available.—August 18, 1905, to June 30, 1921.

Gage.—Staff on the splay wall at the upper end of the lock.

Discharge.—See Hudson river at Mechanicville, page 152.

Accuracy.—Gage read twice daily to tenths.

Coöperation.—Station established by this Department. Gage read by employees of the Department of Public Works.

**Daily elevation of water-surface (B. C. datum) of HUDSON RIVER ABOVE DAM No. 2
MECHANICVILLE, for the year ended June 30, 1921**

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1	47.90	47.55	47.70	50.65	47.75	48.95	a	47.90	48.95	52.4	50.05	47.75
2	47.90	47.75	47.55	50.30	47.90	49.20	48.70	47.85	49.05	51.75	50.35	47.8
3	47.75	48.00	47.60	49.45	48.55	a	49.75	47.80	49.35	a	50.0	47.9
4	47.60	47.85	47.70	49.40	49.40	50.30	49.50	47.75	49.40	50.3	49.9	47.9
5	47.90	47.85	47.55	49.10	49.25	50.70	49.35	47.80	48.90	50.5	49.7	47.4
6	47.75	47.85	47.60	48.95	48.95	52.25	49.40	a	a	49.9	49.4	47.8
7	47.80	47.80	47.65	48.40	48.55	51.45	49.00	48.45	49.70	49.7	49.2	47.85
8	47.80	47.90	47.60	47.90	48.00	50.85	48.95	48.15	50.10	49.9	49.1	47.85
9	47.80	47.65	47.65	47.95	48.55	50.40	a	47.70	50.55	50.1	49.05	47.8
10	47.90	47.70	47.70	47.70	48.30	50.25	48.70	47.70	52.25	a	48.8	47.9

**Daily elevation of water-surface (B. C. datum) of HUDSON RIVER ABOVE DAM No. 2,
MECHANICVILLE, for the year ended June 30, 1921 — Continued**

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
11.....	47.75	48.00	47.70	47.75	48.35	50.20	48.65	47.95	51.75	49.85	48.7	47.8
12.....	47.60	48.20	47.70	47.80	48.40	49.75	48.55	48.35	51.65	49.2	48.5	47.8
13.....	48.05	48.05	47.70	47.85	48.65	a	48.90	a	51.90	49.5	48.15	47.85
14.....	47.95	48.60	47.75	47.75	48.40	49.35	47.95	a	52.05	49.2	48.25	47.9
15.....	47.90	48.00	47.80	47.80	47.80	52.55	48.60	a	51.60	49.1	48.3	48.0
16.....	47.90	48.50	47.90	47.85	48.20	52.20	a	a	51.65	49.2	48.2	47.9
17.....	47.90	48.90	47.90	47.60	48.35	51.90	49.35	a	52.20	a	48.65	47.8
18.....	47.75	48.55	47.75	47.70	48.40	51.30	49.00	a	52.20	49.95	48.5	47.9
19.....	47.55	48.10	47.65	47.70	48.20	a	48.20	a	51.80	50.7	48.3	47.8
20.....	48.05	47.85	47.55	47.75	48.80	50.20	47.85	a	a	49.7	48.15	47.8
21.....	48.05	47.85	47.70	47.65	48.00	49.95	47.80	a	51.70	49.95	48.05	47.75
22.....	48.25	47.80	47.55	47.90	47.80	50.00	48.35	a	52.60	49.95	48.0	47.75
23.....	48.10	47.60	47.60	47.70	48.80	49.90	a	a	52.70	49.15	48.3	47.75
24.....	48.00	47.75	47.55	47.60	50.60	50.20	48.35	a	52.35	a	47.85	47.8
25.....	47.50	47.70	47.65	47.65	49.65	a	48.95	a	51.85	49.75	47.95	47.7
26.....	47.70	47.65	47.85	47.70	49.55	48.90	47.85	a	52.05	49.15	48.0	47.7
27.....	47.80	47.90	47.50	47.80	49.15	49.15	47.80	a	52.00	49.55	47.85	47.75
28.....	47.65	47.60	47.65	47.80	49.00	48.70	47.75	47.95	51.95	49.25	47.8	47.8
29.....	47.80	47.50	47.75	47.85	49.20	49.30	47.75	a	52.05	49.2	47.9	47.9
30.....	47.70	47.70	47.90	48.10	49.30	49.10	a	a	51.70	49.1	47.8	48.15
31.....	47.70	47.65	.....	48.00	.....	49.10	48.35	.....	51.30	.....	47.95	.....

a No record.

HUDSON RIVER NEAR MECHANICVILLE

Gage No. 103

Location.—Below the dam of the Adirondack Power and Light Corporation, about 2 miles below the village of Mechanicville.

Records available.—August 18, 1905, to June 30, 1921.

Gage.—Chain gage on the downstream side of the bridge across the lower end of lock No. 2.

Discharge.—See Hudson river at Mechanicville, page 152.

Accuracy.—Gage read twice daily to tenths.

Coöperation.—Station established by this Department. Gage read by employees of the Department of Public Works.

**Daily elevation of water-surface (B. C. datum) of HUDSON RIVER BELOW
DAM No. 2, MECHANICVILLE, for the year ended June 30, 1921**

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	30.60	30.20	30.45	33.65	30.60	31.90	a	25.45	27.35	34.35	32.55	30.2
2.....	30.50	30.30	30.25	33.40	30.70	33.10	26.60	24.05	27.35	33.45	33.5	30.25
3.....	30.60	30.75	30.45	32.55	31.65	a	28.85	24.90	28.30	a	33.1	30.3
4.....	30.35	30.60	30.30	32.30	32.15	33.40	28.20	24.30	28.25	31.5	32.9	30.4
5.....	30.60	30.60	30.30	32.00	32.05	33.70	28.00	24.65	27.35	31.55	32.75	30.1
6.....	30.45	30.50	30.30	31.95	31.90	36.30	28.00	a	a	31.0	32.5	30.25
7.....	30.40	30.25	30.35	31.30	31.45	35.50	27.25	26.30	28.85	31.15	32.3	30.35
8.....	30.30	30.15	30.10	30.95	31.20	34.55	27.35	26.05	30.00	33.1	32.0	30.15
9.....	30.45	30.10	30.30	31.00	31.50	33.65	a	25.65	30.65	32.45	31.9	30.2
10.....	30.60	30.10	30.40	30.55	31.40	33.35	26.35	25.70	34.30	a	31.65	30.1

Daily elevation of water-surface (B. C. datum) of HUDSON RIVER BELOW LOWER DAM NO. 2, MECHANICVILLE, for the year ended June 30, 1921 — *Continued*

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
11.....	30.40	30.60	30.30	30.60	31.30	33.20	26.70	25.40	33.60	31.6	31.4	30.0
12.....	30.20	30.85	30.25	30.80	31.30	32.65	26.55	25.65	33.25	32.3	31.35	30.05
13.....	30.10	30.85	30.40	30.80	31.65	a	26.00	a	33.60	32.75	31.0	30.35
14.....	30.65	31.15	30.55	30.80	31.40	28.70	25.35	a	33.95	32.0	31.0	30.3
15.....	30.70	30.90	30.50	30.80	30.85	34.35	26.60	a	33.40	32.1	31.05	30.65
16.....	30.90	31.40	30.80	30.90	31.35	34.00	a	a	33.50	32.0	30.9	30.6
17.....	30.85	31.65	30.50	30.55	31.30	33.70	26.35	a	34.10	a	31.3	30.5
18.....	30.40	31.25	30.45	30.40	31.40	32.80	27.20	a	34.05	33.1	31.1	30.55
19.....	30.35	31.05	30.20	30.55	31.30	a	26.70	a	33.65	33.8	31.1	30.45
20.....	30.85	30.80	30.30	30.55	32.05	31.30	25.15	a	a	33.0	31.0	30.4
21.....	31.10	30.60	30.25	30.50	31.10	30.00	25.45	a	33.45	33.3	30.85	30.25
22.....	31.25	30.30	30.45	30.50	30.70	29.70	26.25	a	34.60	33.25	30.4	30.05
23.....	31.10	30.35	30.40	30.50	32.10	29.50	a	a	34.75	32.35	31.1	30.05
24.....	31.00	30.50	30.40	30.30	33.90	29.80	26.10	a	34.45	a	30.9	30.15
25.....	30.15	30.50	30.50	30.35	32.75	a	26.15	a	33.60	32.95	30.75	30.15
26.....	30.45	30.45	30.45	30.60	32.60	27.10	25.70	a	34.00	32.4	30.65	30.0
27.....	30.55	30.50	30.20	30.60	32.35	27.65	24.50	a	33.90	32.75	30.55	30.1
28.....	30.65	30.30	30.15	30.60	32.10	26.90	23.55	25.25	33.75	32.3	30.5	30.2
29.....	30.50	30.20	30.45	30.60	32.20	27.05	25.35	.....	33.85	32.05	30.8	30.4
30.....	30.45	30.35	30.50	31.05	32.10	27.30	a	.....	33.40	31.9	30.45	30.7
31.....	30.30	30.40	.....	30.90	.....	27.10	23.50	.....	32.80	.....	30.55	.....

a No record.

HUDSON RIVER BELOW MECHANICVILLE

Location.—At the dam of the Adirondack Power and Light Corporation, which it $2\frac{1}{2}$ miles below the dam of the West Virginia Pulp and Paper Company.

Drainage area.—4,570 square miles.

Records available.—October 1, 1897, to June 30, 1921.

Gages.—Above dam, staff on crib above power house. Lower gage is a reference point on the hand-rail of downstream truss of highway bridge to Barge canal lock, about 150 yards below power house.

Discharge.—Discharge is determined by the flow over the crest of the dam and water passed through the wheels of the power company.

Extremes of discharge.—Maximum discharge on March 28, 1913, at 8 A. M., 94,000 second-feet; minimum daily discharge on August 29, 1909, 24 second-feet.

Coöperation.—Discharge furnished by the Adirondack Power and Light Corporation, to which is added estimated amount of water used for canal purposes.

Daily flow of HUDSON RIVER AT DAM OF THE ADIRONDACK POWER AND LIGHT CORPORATION, MECHANICVILLE, for the year ending June 30, 1921

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	3,870	2,920	3,160	13,500	3,800	7,990	6,140	3,980	8,460	33,910	11,820	3,650
2.....	3,330	3,180	3,050	14,540	3,780	14,420	7,160	3,290	8,140	30,700	16,190	4,010
3.....	3,040	4,550	3,380	10,690	7,040	15,730	10,560	3,520	9,550	25,770	13,870	4,200
4.....	3,200	4,330	3,470	8,970	8,820	14,630	9,620	3,310	9,820	21,120	13,770	4,560
5.....	3,910	3,890	2,780	8,160	8,260	17,680	9,220	3,680	7,810	20,850	12,920	2,410
6.....	3,500	3,480	2,790	7,360	7,570	29,560	9,340	6,830	6,770	18,530	12,120	3,440
7.....	3,040	2,990	3,030	5,810	6,350	25,430	7,830	6,350	10,880	16,270	10,690	3,580
8.....	3,180	3,300	2,550	5,090	5,510	21,960	7,500	5,780	13,920	14,870	8,560	3,520
9.....	3,440	2,510	2,970	5,020	6,610	16,920	6,460	5,290	17,250	15,680	8,580	3,040
10.....	4,330	2,630	3,000	3,970	6,100	14,780	6,880	5,080	30,300	13,560	7,580	2,950
11.....	3,150	4,030	2,790	4,170	6,070	13,310	7,030	4,670	28,570	13,750	6,750	2,280
12.....	3,440	4,860	2,500	4,030	6,430	11,150	6,520	4,880	28,450	11,980	6,380	2,300
13.....	5,570	4,590	3,030	4,210	6,620	10,470	5,540	4,300	30,330	10,460	6,110	2,890
14.....	4,510	5,330	3,630	4,010	5,850	11,820	5,050	4,230	33,160	9,770	6,260	3,150
15.....	4,930	4,840	3,580	4,000	4,410	29,960	6,360	4,710	30,460	8,150	5,970	4,190
16.....	4,840	6,050	4,020	3,500	5,660	31,300	6,730	4,850	30,760	9,400	5,970	4,210
17.....	3,440	6,570	3,480	3,130	5,610	30,340	6,250	5,880	33,360	10,630	7,290	3,780
18.....	2,980	5,910	3,090	2,480	5,830	25,710	7,110	7,320	33,400	12,930	6,539	3,760
19.....	3,440	5,560	2,640	3,280	5,790	21,330	6,180	7,100	30,570	17,840	6,290	3,360
20.....	5,100	4,670	2,790	3,290	6,460	18,690	4,720	6,640	28,110	16,070	5,870	2,530
21.....	5,460	4,500	2,980	3,060	4,970	13,700	4,800	7,420	30,810	16,200	5,470	2,310
22.....	5,780	3,340	3,180	3,010	4,960	12,490	5,710	9,150	37,450	15,700	4,340	1,950
23.....	5,560	3,160	3,160	2,680	10,670	11,950	5,700	9,340	38,560	12,600	4,890	1,890
24.....	5,400	3,310	3,210	2,450	16,900	12,870	5,940	8,570	36,070	12,540	5,840	2,220
25.....	3,140	3,490	2,960	1,970	11,800	10,460	5,460	5,220	31,910	14,050	5,680	1,940
26.....	2,530	3,070	2,490	2,900	10,790	8,750	5,110	4,980	33,780	11,880	5,120	1,370
27.....	4,290	3,290	1,820	2,710	10,650	7,470	4,210	4,380	33,420	13,110	4,400	1,760
28.....	3,970	2,780	2,320	3,720	9,220	7,050	3,950	5,010	33,060	10,920	4,040	2,010
29.....	3,900	2,500	2,830	3,520	9,390	7,560	4,510	.....	34,240	9,870	4,660	2,560
30.....	3,370	2,960	3,230	4,890	9,050	7,490	3,740	.....	30,450	9,120	3,990	3,750
31.....	2,890	2,930	.....	4,390	.....	6,940	3,550	.....	27,230	.....	4,720	.....

Monthly discharge of HUDSON RIVER AT DAM OF ADIRONDACK POWER AND LIGHT CORPORATION, MECHANICVILLE, for the year ending June 30, 1921

[Drainage area, 4,587 square miles]

MONTH	DISCHARGE IN SECOND-Feet				RUN-OFF
	Maximum	Minimum	Mean	Per square mile	Depth in inches on drainage area
July.....	5,780	2,530	3,980	.867	1.000
August.....	6,570	2,500	3,920	.855	.996
September.....	4,020	1,820	3,000	.654	.730
October.....	14,540	1,970	4,980	1.086	1.253
November.....	16,900	3,780	7,360	1.605	1.790
December.....	31,300	6,940	15,800	3.440	3.970
January.....	10,560	3,550	6,280	1.370	1.580
February.....	9,340	3,290	5,560	1.212	1.261
March.....	38,560	6,770	26,030	5.670	6.540
April.....	33,910	8,150	15,270	3.330	3.710
May.....	16,190	3,990	7,500	1.625	1.886
June.....	4,560	1,370	2,984	.652	.726
The year.....	38,560	1,870	8,555	1.864	25.432

HUDSON RIVER NEAR WATERFORD

Gage No. 102

Location.—Above the Barge canal dam, about 2½ miles north of the village of Waterford.

Records available.—October 25, 1916, to June 30, 1921.

Gage.—Staff at upper end of the east upper gate recess of lock No. 1.

Discharge.—No discharge obtained.

Accuracy.—Gage read twice daily to hundredths.

Coöperation.—Station established by this Department. Gage read by employees of the Department of Public Works.

Daily elevation of water-surface (B. C. datum) of HUDSON RIVER ABOVE LOCK No. 1
NEAR WATERFORD, for the year ended June 30, 1921

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	30.75	30.48	30.55	33.18	30.78	31.80	20.08	19.85	20.21	26.95	32.35	30.35
2.....	30.58	30.64	30.57	32.95	30.75	32.86	20.1	18.79	20.58	25.95	32.95	30.5
3.....	30.51	30.80	30.70	32.38	31.46	33.02	21.22	18.82	20.66	a	32.65	30.5
4.....	30.34	30.82	30.67	32.11	32.12	32.90	21.06	18.53	21.76	23.5	32.6	30.6
5.....	30.66	30.70	30.57	31.92	31.94	33.04	20.76	18.82	20.68	23.6	32.4	30.25
6.....	30.34	30.58	30.40	31.80	31.80	34.82	20.7	19.91	22.15	22.9	32.3	30.4
7.....	30.71	30.47	30.39	31.42	31.48	34.26	20.38	19.78	21.55	27.05	32.25	30.65
8.....	30.75	30.44	30.42	31.12	31.20	33.70	20.42	19.62	22.6	32.65	31.85	30.45
9.....	30.42	30.34	30.62	31.14	31.51	33.16	20.05	19.29	23.25	31.85	31.7	30.45
10.....	30.45	30.43	30.54	30.86	31.33	32.96	19.84	19.28	26.9	a	31.5	30.5
11.....	30.65	30.77	30.57	30.92	31.34	32.82	19.98	19.27	26.15	29.55	31.5	30.25
12.....	30.44	31.09	30.48	30.88	31.53	32.44	19.87	19.72	25.55	a	31.4	30.25
13.....	31.16	30.94	30.49	30.94	31.62	26.86	19.51	a	a	a	31.15	30.45
14.....	31.01	31.29	30.71	30.93	31.47	21.06	19.26	19.1	26.5	a	31.3	30.2
15.....	30.98	31.08	30.80	30.91	31.06	27.30	19.36	19.25	25.9	31.75	31.2	30.6
16.....	30.99	31.32	30.82	30.77	31.40	26.95	20.00	19.2	25.8	31.7	31.05	30.7
17.....	31.33	31.58	30.69	30.90	31.17	26.32	19.80	19.25	26.7	a	31.4	30.5
18.....	30.50	31.38	30.62	30.48	31.42	25.16	21.1	20.65	26.65	32.4	31.2	30.5
19.....	30.56	31.24	30.57	30.81	31.31	23.70	21.3	20.2	26.0	33.2	31.2	30.5
20.....	31.02	31.06	30.59	30.78	31.66	23.36	20.45	20.24	a	32.55	31.1	30.5
21.....	31.22	30.81	30.52	30.76	31.25	22.20	20.22	21.52	25.8	32.9	31.0	30.4
22.....	31.29	30.64	30.57	30.64	30.96	21.88	20.1	20.76	27.5	32.85	30.5	30.3
23.....	31.17	30.45	30.53	30.66	31.98	21.79	20.0	20.4	27.8	32.3	30.6	30.35
24.....	31.14	30.53	30.55	30.66	33.35	22.13	19.92	19.41	27.1	32.4	31.1	30.35
25.....	30.67	30.67	30.58	30.38	32.59	21.68	21.08	19.62	26.05	32.6	31.05	30.3
26.....	30.58	30.53	30.53	30.86	32.36	21.05	20.52	19.7	26.35	32.25	31.15	30.0
27.....	30.71	30.77	30.26	30.48	32.29	20.92	19.6	19.46	a	32.3	30.8	30.3
28.....	30.71	30.42	30.54	30.70	32.08	20.08	18.94	19.14	26.25	32.25	30.65	30.4
29.....	30.62	30.37	30.71	30.88	32.02	20.32	19.52	.....	26.65	32.1	30.8	30.5
30.....	30.67	30.48	30.60	31.18	32.08	20.44	19.72	.....	25.7	32.0	30.55	30.65
31.....	30.49	30.54	.....	31.08	.....	20.10	18.56	.....	24.95	.....	30.7	.....

Taintor gates all closed — noon December 13.

a No record.

HUDSON RIVER NEAR WATERFORD

Gage No. 101

Location.—Below Barge canal dam, about 2½ miles north of the village of Waterford.

Records available.—October 25, 1916, to June 30, 1921.

Gage.—Staff in two sections; lower section on north end of the west lower approach wall; upper section on the lower end of the lower west thrust wall.

Dicharge.—No discharge obtained.

Accuracy.—Gage read twice daily to hundredths.

Coöperation.—Station established by this Department. Gage read by employees of the Department of Public Works.

Daily elevation of water-surface (B. C. datum) of HUDSON RIVER BELOW LOCK No. 1
NEAR WATERFORD, for the year ended June 30, 1921

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	17.27	17.01	17.08	22.35	17.43	18.69	18.32	17.78	18.82	22.8	20.35	17.2
2.....	17.13	17.02	17.06	21.72	17.30	21.44	18.44	17.50	19.23	22.25	20.95	17.2
3.....	17.07	17.30	17.14	19.10	18.34	21.56	19.44	17.63	19.68	a	20.1	17.2
4.....	17.20	17.33	17.14	18.93	19.15	20.55	19.44	17.42	20.82	20.65	19.55	17.2
5.....	17.07	17.04	16.96	18.82	18.70	20.54	19.22	17.50	19.86	20.65	19.4	16.95
6.....	17.06	16.99	16.88	18.43	18.32	24.97	19.22	18.41	18.80	20.15	19.2	17.0
7.....	17.05	16.97	16.95	18.12	18.16	22.50	18.96	18.32	19.95	18.40	19.0	17.1
8.....	17.08	16.88	16.94	17.90	17.74	21.24	18.74	18.14	21.25	19.45	18.6	17.15
9.....	17.01	16.80	16.98	17.73	18.14	20.16	18.58	18.06	21.75	19.8	18.6	17.15
10.....	17.32	16.89	17.08	17.61	18.25	19.85	18.40	17.84	24.45	a	18.15	17.1
11.....	16.98	17.20	17.07	17.63	18.28	19.69	18.38	17.86	23.10	19.1	18.2	16.95
12.....	17.00	18.19	17.36	17.38	18.18	19.36	18.25	18.92	22.40	a	18.1	16.9
13.....	17.58	17.77	18.94	17.48	18.12	19.42	18.18	a	a	a	17.9	17.05
14.....	17.34	17.86	18.32	17.44	18.06	19.35	17.80	17.60	23.05	a	18.0	16.8
15.....	17.56	18.28	17.80	17.42	17.69	24.72	18.17	17.70	22.20	18.2	18.0	17.3
16.....	17.44	18.13	17.52	17.40	17.89	23.77	18.38	17.80	22.50	17.2	17.9	17.3
17.....	17.33	18.22	17.70	17.19	17.99	22.94	18.58	18.02	23.30	a	18.0	17.0
18.....	16.97	18.17	17.44	17.11	18.54	21.96	19.28	19.84	23.05	18.45	17.9	17.1
19.....	17.00	17.88	17.25	17.30	18.70	21.21	18.33	19.60	22.55	20.3	17.8	17.0
20.....	17.78	17.67	17.19	17.38	18.44	20.38	17.83	18.65	a	19.7	17.6	16.8
21.....	17.96	17.53	17.05	17.38	18.34	19.69	18.04	18.65	22.65	19.75	17.6	16.8
22.....	17.62	17.24	17.02	17.13	17.96	19.49	18.42	18.74	23.60	19.75	17.2	16.8
23.....	17.57	17.02	17.02	17.12	19.15	19.37	18.58	18.30	23.70	19.2	17.3	16.8
24.....	17.62	17.02	17.09	17.13	22.00	19.64	18.58	17.82	23.00	16.5	17.6	16.75
25.....	17.20	17.22	17.09	16.90	20.16	19.36	18.40	18.10	22.30	19.1	17.6	16.7
26.....	17.21	17.02	17.00	17.16	19.66	18.76	18.31	17.92	22.50	19.2	17.8	16.45
27.....	17.14	17.08	16.62	17.22	19.32	18.69	17.78	18.20	a	19.2	17.5	16.75
28.....	17.21	16.96	17.08	17.36	18.90	18.16	17.62	17.75	22.60	18.95	17.25	16.9
29.....	17.16	17.04	17.40	17.54	18.98	18.40	18.01	.....	22.65	18.8	17.35	16.9
30.....	17.08	16.90	17.29	17.74	19.04	18.55	17.70	.....	22.20	18.65	17.3	17.3
31.....	16.97	17.01	.....	17.60	.....	18.49	17.22	.....	21.55	.....	17.35	.....

a No record.

OPALESCENT RIVER BELOW FLOWED LAND, NEAR TAHAWUS

Location.—In the town of Newcomb, Essex county, $\frac{1}{8}$ mile below the dam at the outlet of flowed land, about 8 miles above Hudson river and about 14 miles northeast of Tahawus post-office.

Drainage area.—9 square miles (measured on topographic maps).

Records available.—November 25, 1920, to June 30, 1921.

Gage.—Staff gage in two sections on left bank; the lower inclined, the upper vertical.

Meteorological equipment.—Meteorological equipment includes standard shelter, maximum and minimum thermometers, rain gage, snow tube and stake, density bucket and scales. A portion of this equipment furnished by United States Weather Bureau.

Discharge measurements.—Made by wading above gage at low and medium stages; no equipment installed for high-stage measurements.

Channel and control.—Channel very rough, with many boulders; precipitous below gage. Control is a rock ledge overlaid with large boulders a few feet below gage.

Extremes of discharge.—Maximum stage recorded during period, 7.8 feet at 4 P. M., March 21 (above present limits of rating curve); minimum stage recorded, 1.35 feet at 9:30 A. M., May 11, and 9 A. M., June 4 (discharge, about 0.8 second-foot).

Ice.—Stage-discharge relation probably not seriously affected by ice.

Regulation.—Flow regulated by storage in flowed land. Diurnal flow in spring frequently affected by flood waves caused by tripping the dam at the outlet of flowed land during log-driving operations.

Diversions.—None, except that at high stages of flowed land there may be some leakage through dam at head of Calamity brook and out of the drainage area. No record of such possible leakage available.

Accuracy.—Stage-discharge relation permanent. Rating curve well defined between 5 and 150 second-feet; approximate above and below. Daily discharge ascertained by applying daily gage-heights to rating table. For days of great fluctuation mean gage-heights are estimated from hydrograph. Records good for range of rating, otherwise approximate.

Coöperation.—Gage readings made by employees of New York State Conservation Commission. Station maintained by United States Geological Survey in coöperation with the State Engineer and Surveyor.

Discharge measurements of OPALESCENT RIVER BELOW FLOWED LAND NEAR TAHAWUS,
during the year ending June 30, 1921

DATE	Made by	Gage height	Discharge
		<i>Feet</i>	<i>Sec.-ft.</i>
Nov. 14.....	Covert and Harrington.....	2.20	23.7
Jan. 13.....	Harrington and Currier.....	1.82	6.56
Feb. 20.....	Harrington and Currier.....	1.79	5.47
Mar. 19.....	Howe and Currier.....	2.55	38.6
Mar. 20.....	Howe and Currier.....	2.54	38.6
April 6.....	B. F. Howe.....	2.88	81.7
April 7.....	B. F. Howe.....	3.26	131
April 7.....	B. F. Howe.....	3.23	130
June 24.....	Shupe and Covert.....	1.87	7.90

Daily discharge, in second-feet, of OPALESCENT RIVER BELOW FLOWED LAND, NEAR
TAHAWUS, for the year ending June 30, 1921

DAY	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....		50.		3.4	4.6	48.	2.7	1.2
2.....		125.		3.4	4.6	43.	48.	9
3.....		57.		3.4	4.6	35.	62.	1.0
4.....		43.		3.4	4.6	28.	40.	8
5.....		50.		3.4	4.6	35.	17.	12.
6.....		50.		3.4	4.6	84.	5.7	8.5
7.....		52.		3.4	4.6	140.	5.7	5.7
8.....		32.		3.4	10.	132.	4.6	5.7
9.....		25.		3.4	350.	290.	3.4	2.7
10.....		22.	7.1	3.4	265.	140.	.9	.9
11.....		20.	7.1	3.4	96.	52.	.8	1.0
12.....		17.	7.1	3.4	62.	43.	.9	22.
13.....		17.	6.3	2.7	52.	35.	1.0	28.
14.....		118.	5.7	2.7	43.	28.	1.0	35.
15.....		185.	5.7	2.7	62.	5.7	1.2	32.
16.....		62.	5.7	2.7	215.	125.	1.2	25.
17.....		39.	5.7	3.4	195.	52.	1.2	22.
18.....		28.	5.7	4.6	155.	72.	.9	28.
19.....		28.	5.7	5.7	48.	62.	1.2	43.
20.....		22.	5.7	5.7	48.	12.	1.6	35.
21.....		20.	5.7	5.7	1,410.	62.	1.2	22.
22.....		20.	5.7	5.7	510.	43.	1.2	14.
23.....		17.	4.6	5.7	67.	17.	3.4	12.
24.....		14.	4.6	5.7	52.	35.	3.4	8.5
25.....	12	12.	4.6	5.7	175.	43.	2.7	5.7
26.....	12	12.	4.6	4.6	155.	8.5	2.0	4.6
27.....	12	8.5	4.6	4.6	155.	2.7	2.0	4.6
28.....	12	8.5	4.6	4.6	420.	52.	2.0	3.4
29.....	12	8.5	4.6		140.	48.	1.6	3.4
30.....	12	8.5	4.6		118.	3.4	1.2	2.7
31.....		8.5	3.4		52.		1.0	

NOTE.— Discharge estimated from hydrograph and study of weather records Dec. 1, 5, 6, Jan. 1-9 at 8.0 second-feet, Feb. 12, 13, Mar. 2, May 4; no gage-height record. Mean daily gage-heights Dec. 14, 15, Mar. 8-10, 16, 21, 22, 25, 28, April 21, 25, 28, May 2, determined from plotted graph on account of great fluctuation in stage.

Monthly discharge of OPALESCENT RIVER BELOW FLOWED LAND NEAR TAHAWUS'
for the year ending June 30, 1921

[Drainage area, 9 square miles]

MONTH	DISCHARGE IN SECOND-FEET				RUN-OFF
	Maximum	Minimum	Mean	Per square mile	Depth in inches on drainage area
November 25-30.....	112	12	12.0	1.33	.30
December.....	185	8.5	38.0	4.22	4.86
January.....	.....	3.4	616	.684	.79
February.....	5.7	2.7	4.05	.450	.47
March.....	1,410	4.6	158	17.6	20.29
April.....	290	2.7	59.2	6.58	7.34
May.....	62	.8	7.18	.798	.92
June.....	43	.8	13.0	1.44	1.61

NOTE.—The above figures on discharge in second-feet per square mile and run-off in depth in inches do not necessarily represent the natural flow from the drainage, because of artificial storage in flowed Land.

INDIAN RIVER

Indian river rises in the central part of Hamilton county and flows northeast into the Hudson river. On this river is found the one important regulating reservoir on the Upper Hudson basin. A masonry dam, 33 feet high, was built at the outlet of Indian lake in 1897-98 which, with the aid of 2-foot flash boards, impounds 5,000,000,000 cubic feet of water.

INDIAN LAKE RESERVOIR NEAR INDIAN LAKE

Location.—At masonry storage dam at outlet of Indian lake, 2 miles south of Indian Lake village, Hamilton county, and $7\frac{1}{2}$ miles above mouth of Indian river.

Drainage area.—131 square miles, including about 9.3 square miles of water surface of Indian lake at the elevation of crest of spillway (measured on topographic maps).

Records available.—Records of stage and gate openings from July 22, 1900, to June 30, 1921.

Gages.—Elevation of water surface in reservoir is determined by chain gage on dam near gate house; prior to November 17, 1911, a staff gage was used at same site. Mean elevation of crest of spillway is at gage height 33.38 feet. Widths of sluice gate openings determined by gage scales at sides of gate stems inside gate house. Gages read by Lester Sevarie.

Extremes of stage.—Maximum elevation of water surface in reservoir during year, 35.35 feet, April 18; minimum elevation, 13.75 feet, October 27 and 28.

1900-1921: Maximum elevation recorded, 38.8 feet, March 28, 1913; minimum elevation recorded, 2.0 feet, March 9-18, 1907, and January 3-17, 1910.

Regulation.—At ordinary stages the discharge is completely regulated by the operation of the sluice gates. Water is held in storage until needed to supplement the flow of the Upper Hudson during the low-water period. The storage capacity is about 4.7 billion cubic feet, equivalent to a flow of about 600 second-feet for 90 days.

Coöperation.—Station maintained by the United States Geological Survey in coöperation with the State Engineer and Surveyor.

Daily gage height, in feet, of INDIAN LAKE RESERVOIR NEAR INDIAN LAKE, for the year ending June 30, 1921

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.	31.7	30.2	23.2	16.45	14.0	16.95	25.25	27.75	20.1	34.85	35.3	34.05
2.	31.6	29.95	22.8	16.6	14.15	17.25	25.35	27.45	19.8	34.8	35.3	34.05
3.	31.7	29.7	22.5	16.7	14.3	17.5	25.5	27.25	19.7	34.85	35.25	34.1
4.	31.75	29.45	22.6	16.85	14.45	17.8	25.7	27.05	19.7	34.85	35.15	34.05
5.	31.8	29.2	22.4	16.85	14.55	18.05	25.85	26.85	19.8	34.9	35.0	34.05
6.	31.8	29.0	22.0	16.9	14.75	18.7	25.95	26.65	19.9	34.95	34.9	34.05
7.	31.6	28.75	21.6	16.95	14.9	19.05	26.05	26.4	20.1	34.9	34.85	34.05
8.	31.35	28.35	21.2	17.0	15.0	19.35	26.1	26.2	20.35	34.8	34.9	34.0
9.	31.15	27.9	20.9	17.0	15.1	19.5	26.15	26.0	20.9	34.8	34.95	34.0
10.	31.0	27.5	20.6	16.9	15.2	19.65	26.2	25.85	21.75	34.75	34.95	34.0
11.	30.85	27.3	20.4	16.7	15.3	19.75	26.25	25.7	22.4	34.7	34.95	34.0
12.	30.75	27.3	20.2	16.5	15.35	19.85	26.3	25.45	22.95	34.7	34.95	33.9
13.	30.85	27.5	19.95	16.3	15.4	19.95	26.35	25.05	23.4	34.65	35.0	33.8
14.	30.95	27.55	19.7	16.1	15.45	20.45	26.4	24.8	24.0	34.6	35.05	33.65
15.	31.0	27.5	19.6	15.95	15.5	22.0	26.55	24.45	24.5	34.75	35.1	33.45
16.	31.1	27.45	19.5	15.75	15.6	22.85	26.65	24.15	25.25	35.0	35.1	33.2
17.	31.0	27.25	19.35	15.55	15.7	23.35	26.75	23.8	26.05	35.25	35.1	33.05
18.	30.75	27.1	19.15	15.4	15.8	23.65	26.8	23.5	26.75	35.35	35.1	32.85
19.	30.75	27.0	18.8	15.2	15.95	23.85	26.85	23.2	27.1	35.2	35.05	32.65
20.	30.85	26.9	18.4	15.0	16.05	24.0	26.95	22.9	27.75	34.95	34.75	32.45
21.	30.9	26.7	18.1	14.85	16.15	24.1	27.05	22.55	29.1	34.75	34.35	32.25
22.	30.95	26.3	17.8	14.7	16.25	24.2	27.2	22.2	30.3	34.8	34.0	32.05
23.	31.0	25.85	17.4	14.5	16.35	24.35	27.3	21.9	31.0	34.8	33.95	31.85
24.	31.0	25.6	17.2	14.3	16.45	24.55	27.4	21.5	31.4	34.9	33.95	31.7
25.	31.0	25.3	17.05	14.1	16.55	24.65	27.45	21.1	32.2	34.95	33.95	31.55
26.	31.0	25.05	16.7	13.9	16.65	24.75	27.5	21.0	33.15	34.9	33.95	31.4
27.	31.0	24.75	16.35	13.75	16.7	24.85	27.55	20.7	33.8	34.9	33.95	31.25
28.	30.95	24.45	16.15	13.75	16.75	24.95	27.6	20.4	34.5	34.85	34.0	31.1
29.	30.8	24.1	16.05	13.8	16.8	25.05	27.65	.....	34.95	34.85	34.0	30.95
30.	30.7	23.7	16.0	13.85	16.85	25.15	27.7	.....	35.1	35.0	34.05	30.9
31.	30.55	23.5	.....	13.9	.....	25.2	27.75	.....	35.0	.....	34.05	.....

Gate openings, in inches, at INDIAN LAKE RESERVOIR NEAR INDIAN LAKE, for the year ending June 30, 1921

DATE	Sluice gate A open	Sluice gate B open
July 1, 12 A. M. to July 2, 2 P. M.	60	
July 6, 1 P. M. to July 12, 9 A. M.		54
July 17, 1 P. M. to July 19, 11 A. M.		54
July 27, 8 P. M. to July 31, 3 P. M.	60	
July 31, 3 P. M. to Aug. 1, 4 P. M.	60	54
Aug. 1, 4 P. M. to Aug. 7, 10 A. M.		54
Aug. 7, 10 A. M. to Aug. 11, 5 P. M.	60	54
Aug. 11, 5 P. M. to Aug. 12, 11 A. M.		54
Aug. 14, 1 P. M. to Aug. 21, 10 A. M.	60	
Aug. 21, 10 A. M. to Aug. 23, 5 P. M.	60	54
Aug. 23, 5 P. M. to Aug. 28, 1 P. M.	60	30
Aug. 28, 1 P. M. to Sept. 3, 6 A. M.	60	54
Sept. 5, 7 A. M. to Sept. 10, 8 A. M.	60	54
Sept. 10, 8 A. M. to Sept. 11, 7 A. M.	60	
Sept. 11, 7 A. M. to Sept. 14, 9 A. M.	60	54
Sept. 14, 9 A. M. to Sept. 18, 7 A. M.	60	
Sept. 18, 7 A. M. to Sept. 24, 6 A. M.	60	54
Sept. 24, 6 A. M. to Sept. 25, 7 A. M.	60	
Sept. 25, 7 A. M. to Sept. 28, 6 P. M.	60	54
Sept. 28, 6 P. M. to Sept. 30, 2 P. M.	60	
Oct. 10, 8 A. M. to Oct. 28, 8 A. M.		54
Feb. 1, 11 A. M. to Feb. 12, 8 A. M.		54
Feb. 12, 8 A. M. to Mar. 2, 7 P. M.	60	54
Mar. 2, 7 P. M. to Mar. 4, 10 A. M.	60	
Mar. 28, 7 A. M. to ———, 6 P. M.		54
Mar. 27, 1 P. M. to Mar. 29, 1 P. M.		54
Mar. 30, 7 A. M. to April 1, 7 A. M.	60	54
April 1, 7 A. M. to April 2, 1 P. M.	60	30
April 2, 1 P. M. to April 6, 1 P. M.	60	
April 6, 1 P. M. to April 10, 8 A. M.	60	30
April 10, 8 A. M. to April 14, 8 P. M.	60	
April 16, 1 P. M. to April 17, 8 A. M.		54
April 17, 8 A. M. to April 21, 5 P. M.	54	54
April 21, 5 P. M. to April 28, 5 P. M.	54	
April 28, 5 P. M. to April 30, 10 A. M.	30	
May 2, 8 A. M. to May 7, 7 P. M.	54	
May 20, 7 A. M. to ———, 6 P. M.		30
May 21, 7 A. M. to ———, 6 P. M.		30
May 22, 7 A. M. to ———, 6 P. M.		30
June 11, 7 P. M. to June 30, 1 P. M.	60	

NOTE.— Main logway open 15 feet during following periods: May 20, 7 A. M. to 6 P. M.; May 21, 7 A. M. to 6 P. M.; May 22, 7 A. M. to 6 P. M.; small logway open 15 feet during following periods: April 18, 1 P. M. to April 20, 7 A. M.; May 2, 9 A. M. to May 5, 7 A. M.

INDIAN RIVER NEAR INDIAN LAKE

Location.—About $\frac{3}{4}$ of a mile below the dam at outlet of Indian lake, 2 miles south of Indian Lake village, Hamilton county, 1 mile above mouth of Big brook and $6\frac{1}{2}$ miles above mouth of Indian river.

Drainage area.—132 square miles (measured on topographic maps).

Records available.—July 1, 1912, to June 30, 1914; June 5, 1915, to June 30, 1921; also miscellaneous measurements in 1911.

Gage.—Gurley 7-day graph water-stage recorder, installed August 30, 1916, on right bank, $\frac{3}{4}$ of a mile below dam, at same datum as staff gage previously used. Recorder inspected by Lester Sevarie.

Discharge measurements.—Made from cable about 75 feet below gage, or by wading.

Extremes of discharge.—Maximum stage during year from water-stage recorder, 5.76 feet at 3:30 P. M., May 21 (during a log drive); (discharge, 1,990 second-feet); minimum stage from water-stage recorder, 0.10 foot from 6 to 7:30 A. M., September 5 (discharge, 1.9 second-feet).

1912–1921: Maximum stage recorded, 7.8 feet at 4 P. M., March 28, 1913 (discharge, 3,460 second-feet); minimum stage from water-stage recorder, 0.04 foot at 5 A. M., October 2, 1918 (discharge, about 1.3 second-feet; discharge of 0.7 second-foot at 12 M., September 30, 1918, corresponding to gage-height of 0.07 foot).

Channel and control.—Control is a reef of coarse gravel; permanent.

Ice.—Stage-discharge relation not affected by ice.

Regulation.—Discharge is regulated by operation of the sluice gates at Indian Lake dam.

Accuracy.—Stage-discharge relation permanent. Rating curve well defined between 15 and 1,500 second-feet. Operation of water-stage recorder satisfactory, except for periods indicated in footnote to daily-discharge table. Daily discharge ascertained by applying to rating table mean daily gage-height determined by inspection of the recorder graph or, for days when there have been changes in openings of sluice gates at Indian Lake dam, by averaging the discharge for bi-hourly intervals of the day. Records good, except for periods for which recorder did not operate satisfactorily.

Coöperation.—Station maintained by the United States Geological Survey in coöperation with the State Engineer and Surveyor.

The following discharge measurement was made by Currier and Harrington: January 16, 1921; gage-height, 0.49 foot; discharge, 18.1 second-feet.

Daily discharge, in second-feet, of INDIAN RIVER NEAR INDIAN LAKE, for the year ending June 30, 1921

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	344.0	784	767	16	9.5	10	12	267	684	985	92	153
2.....	206	526	746	12	9.5	13	14	439	532	672	647	154
3.....	5.0	526	193	12	10	10	15	499	253	508	986	146
4.....	3.9	526	2.9	11	10	8.6	14	439	110	508	963	144
5.....	3.5	526	482	11	9.9	12	13	439	11	508	602	142
6.....	227	526	725	11	9.0	13	19	439	9.9	623	436	142
7.....	545	680	725	11	8.6	11	13	439	12	746	362	142
8.....	545	853	704	11	8.3	9.9	14	439	12	725	83	142
9.....	545	853	704	11	8.3	9.9	14	439	13	725	84	144
10.....	408	853	408	222	9.0	9.9	14	439	15	512	84	124
11.....	341	729	576	359	9.0	11	13	471	16	366	84	163
12.....	154	253	684	356	8.6	10	13	658	15	363	84	526
13.....	3.7	3.9	684	366	9.0	9.9	13	746	17	315	86	526
14.....	3.5	136	428	356	9.0	26	14	746	20	52	98	526
15.....	3.3	325	259	353	8.6	18	15	746	23	48	106	526
16.....	3.1	325	256	356	8.3	14	15	746	22	216	105	526
17.....	220	322	256	353	8.6	14	15	746	18	826	103	526
18.....	545	322	520	353	8.3	12	20	746	17	1,200	105	526
19.....	292	319	664	353	8.6	12	22	746	18	1,270	100	508
20.....	4.4	319	643	350	9.0	12	21	725	28	1,080	903	508
21.....	3.7	612	643	347	9.0	11	16	725	32	770	1,070	508
22.....	3.5	832	623	344	9.0	11	16	725	36	436	961	508
23.....	3.3	765	623	331	9.0	12	16	704	46	418	272	508
24.....	3.5	603	310	328	9.5	12	16	704	51	418	176	508
25.....	3.3	603	481	322	9.5	12	16	684	60	436	164	489
26.....	3.1	603	603	322	9.5	11	16	684	904	436	162	489
27.....	23	584	584	322	9.5	11	16	684	366	436	162	489
28.....	350	620	458	121	9.5	11	16	684	623	402	164	489
29.....	359	767	207	10	9.5	11	18	.....	423	372	164	489
30.....	363	767	130	9.0	9.5	11	17	.....	756	198	162	366
31.....	533	767	.....	9.0	.....	11	16	.....	1060	.....	162	.....

NOTE.—Discharge for following periods during which water-stage recorder did not operate satisfactorily, determined from gage-heights estimated from graph and from record of gate openings and elevation of water in Indian Lake reservoir: November 28, February 1-4, 6-17, March 2-4, 7-11, 13-17, 22-25, 29-31, April 6-8, 27-29, May 1-12.

Monthly discharge of INDIAN RIVER NEAR INDIAN LAKE, for the year ending June 30, 1921

[Drainage area, 132 square miles]

MONTH	DISCHARGE IN SECOND-FEET				RUN-OFF Depth in inches on drainage area
	Maximum	Minimum	Mean	Per square mile	
July.....	545	3.1	195	1.48	1.71
August.....	853	3.9	556	4.21	4.85
September.....	767	2.9	503	3.81	4.25
October.....	359	9.0	204	1.55	1.79
November.....	10	8.3	9.09	.069	.08
December.....	26	8.6	11.9	.090	.10
January.....	22	12	15.4	.117	.13
February.....	746	267	619	4.69	4.88
March.....	1,060	9.9	182	1.38	1.59
April.....	1,270	48	552	4.18	4.66
May.....	1,070	83	314	2.38	2.74
June.....	526	124	372	2.82	3.15
The year.....	1,270	2.9	291	2.20	29.93

NOTE.—The monthly discharge in second-feet per square mile and run-off in depth in inches shown by the table do not represent the natural flow from the basin because of artificial storage in Indian Lake reservoir.

SCHROON RIVER

DESCRIPTION

Schroon river rises in Essex county, along the southern slopes of the highest mountains in the Adirondack group, flows in a general southerly direction for about 45 miles through Essex and Warren counties and joins the Hudson near Thurman. Its total drainage area is 550 square miles. Its headwaters reach an elevation of about 2,000 feet above mean tide; its mouth is at an elevation of about 600 feet.

Its basin is largely forested and contains considerable wild land and numerous lakes and ponds. The most important of these is Schroon lake, through which the river flows, which has a water-surface area of about 6.3 square miles. The only power-plants are at Warrensburg.

SCHROON RIVER AT RIVERBANK

Location.—At the steel highway bridge, near Riverbank post-office, Warren county, near Tumblehead falls, about 9 miles below Schroon lake and about 9 miles above Warrensburg.

Drainage area.—534 square miles.

Records available.—September 2, 1907, to June 30, 1921.

Gage.—Chain on upstream side of bridge; read by J. H. Roberts.

Discharge measurements.—Made from the upstream side of bridge.

Channel and control.—Gravel; occasionally shifting. Logs become lodged on the control at times nearly every year.

Extremes of discharge.—Maximum stage recorded during year, 7.18 feet at 8 A. M., March 23 (discharge, 5,720 second-feet); minimum stage recorded, 1.20 feet at 8 A. M. October 29 (—0.05 foot backwater correction for logs), discharge, 87 second-feet.

1907–1921: Maximum stage recorded, 10.7 feet at 5 P. M. March 29, 1913 (discharge, about 13,500 second-feet); minimum stage recorded, 0.85 foot at 5 P. M. October 17, 1909 (discharge, 28 second-feet).

Ice.—Stage-discharge relation affected by ice.

Regulation.—Flow affected by storage in Schroon and Brant lakes.

Accuracy.—Stage-discharge relation probably permanent during year except as affected by ice during winter and by logs on

the control; duration of such effect October 1 to March 23. Rating curve fairly well defined between 150 and 4,000 second-feet. Gage read to hundredths twice daily. Daily discharge ascertained by applying mean daily gage height to rating table. Records good except those for periods when stage-discharge relation was affected by ice or logs for which they are fair.

Coöperation.—Station maintained by the United States Geological Survey in coöperation with the State Engineer and Surveyor.

Discharge measurements of SCHROON RIVER AT RIVERBANK, during the year ending
June 30, 1921

DATE	Made by	Gage height	Discharge
		<i>Feet</i>	<i>Sec.-ft.</i>
July 28.....	C. C. Covert.....	a 2.57	491
Aug. 19.....	Howe and Currier.....	a 1.68	217
Sept. 26.....	Shupe and Currier.....	a 1.74	228
Jan. 18.....	Currier and Harrington.....	b 3.15	703
Jan. 31.....	Howe and Shupe.....	b 2.38	460
Feb. 14.....	S. M. Currier.....	b 2.21	373
Mar. 22.....	S. M. Currier.....	a 6.80	4,860
April 12.....	B. F. Howe.....	3.78	1,460

a Backwater from logs.

b Backwater from ice.

Daily discharge, in second-feet, of SCHROON RIVER AT RIVERBANK, for the year
ending June 30, 1921

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	172	158	201	407	248	512	718	460	340	3,600	1,210	281
2.....	145	172	201	388	298	512	772	480	340	3,340	1,130	281
3.....	158	186	186	389	316	535	745	420	360	3,080	1,210	281
4.....	158	172	186	351	316	585	772	400	360	2,840	1,130	281
5.....	158	172	186	351	316	610	772	420	340	2,370	990	281
6.....	158	158	186	427	316	610	772	400	360	2,370	920	264
7.....	186	172	186	407	281	610	718	420	360	2,370	860	264
8.....	172	145	186	407	298	1,170	662	380	360	1,940	800	264
9.....	186	145	186	427	281	1,100	662	380	400	1,740	718	264
10.....	216	158	186	388	316	1,100	635	380	1,200	1,550	718	264
11.....	281	145	186	427	298	1,100	610	400	1,800	1,550	745	281
12.....	298	145	281	407	298	1,020	585	380	2,400	1,370	718	281
13.....	316	158	316	388	281	1,100	600	380	2,600	1,370	718	264
14.....	333	172	333	369	298	1,020	600	380	3,000	1,370	718	264
15.....	316	427	333	351	316	2,100	600	400	3,200	1,290	990	264
16.....	281	512	316	351	298	2,320	600	380	3,400	.....	635	264
17.....	316	535	316	316	316	2,540	650	360	3,800	.....	585	264
18.....	316	316	298	447	316	2,540	650	360	4,000	.....	585	264
19.....	351	201	264	447	316	2,320	600	380	3,600	.....	535	264
20.....	351	201	264	427	333	1,990	600	360	3,600	1,370	512	248
21.....	468	216	264	388	333	1,890	550	360	3,800	1,370	512	264
22.....	427	201	248	351	351	1,790	550	360	5,000	1,290	490	264
23.....	427	216	248	351	369	1,690	500	340	5,500	1,290	490	264
24.....	369	201	232	281	427	1,500	500	320	5,110	1,290	490	264
25.....	351	201	232	248	427	1,420	500	320	5,110	1,290	490	248

Daily discharge, in second-feet, of SCHROON RIVER AT RIVERBANK, for the year ending June 30, 1921 — *Continued*

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
26.....	407	186	216	264	427	1,170	480	320	5,270	1,290	427	264
27.....	351	186	216	97	407	1,020	460	340	5,480	1,210	407	264
28.....	351	201	232	97	427	955	460	340	5,270	1,130	333	369
29.....	388	186	232	87	427	990	440	.....	5,110	1,130	281	369
30.....	281	186	232	186	468	890	440	.....	4,790	1,130	281	388
31.....	158	201	.....	281	.....	772	440	.....	4,470	.....	281	.....

NOTE.— Discharge, January 13 to February 28, determined from gage-heights corrected for ice effect on basis of 3 discharge measurements, weather records and comparison with other stations. Discharge, July 1 to January 12, and March 1-23, determined by indirect method owing to backwater from logs on control. Mean daily discharge April 16-19 estimated at 1,350 second-feet, no gage-height record.

Monthly discharge of SCHROON RIVER AT RIVERBANK, for the year ending June 30, 1921

[Drainage area, 534 square miles]

MONTH	DISCHARGE IN SECOND-FEET				RUN-OFF Depth in inches on drainage area
	Maximum	Minimum	Mean	Per square mile	
July.....	468	145	285	0.534	0.62
August.....	535	145	214	.401	.46
September.....	333	186	238	.446	.50
October.....	447	87	338	.633	.73
November.....	468	248	337	.631	.70
December.....	2,540	512	1,270	2.38	2.74
January.....	772	440	601	1.13	1.30
February.....	480	320	379	.710	.74
March.....	5,500	340	2,930	5.49	6.33
April.....	3,600	1,130	1,710	3.20	3.57
May.....	1,210	281	674	1.26	1.45
June.....	388	248	282	.528	.59
The year.....	5,500	87	776	1.45	19.73

NOTE.— The monthly discharge in second-feet per square mile and run-off in depth in inches shown by the table do not necessarily represent the natural flow from the basin because of artificial storage in Schroon and Brant lakes.

SACANDAGA RIVER DESCRIPTION

Sacandaga river is one of the larger tributaries of the upper Hudson. It drains extensive portions of the southeast slope of the Adirondack region as well as a portion of the plateau lying north of Mohawk river and south of the Adirondack mountains. The headwaters of the stream rise in the slopes surrounding Lake Pleasant, Sacandaga and Piseco lakes. It is formed by three principal branches, which unite in the southeastern part of

Hamilton county. The west branch is the outlet at Piseco lake, the middle branch is the outlet of Sacandaga and Pleasant lakes, the east and principal branch issues from a series of small ponds and lakes in the southwestern part of Warren county. Sacandaga lake, the highest of the tributary lakes in the headwaters, is about 1,700 feet above mean tide. The east and middle branches unite a few miles north of Wells and are joined by the west branch a short distance below Wells. The river then flows southeasterly to a point about five miles below Northville. Above Northville the drainage basin is rugged and almost completely forest-covered. From Northville to Conklingville the stream winds through a sandy valley flanked by steep slopes. The width of this valley averages about one mile from Northampton to Conklingville. Above Northampton is an extensive flat lying at an elevation of about 740 feet. This flat is drained by Mayville, Vly and Hann's creeks and contains extensive swamp areas. From Northville to Conklingville, a distance along the general course of the stream of about 22 miles, there is very little fall. The elevation at Conklingville is about 720 feet. Sacandaga river enters Hudson river at Luzerne at elevation about 540 feet. Between Northville and the mouth of the river there is a fall of about 180 feet (chiefly concentrated in the five miles below Conklingville) entirely unutilized. There are, in fact, no power developments on the Sacandaga.

The drainage area of this river, about 1,060 square miles, is largely in forest. The mean precipitation is high, being about 49 inches, whereas the mean for the whole Hudson drainage area above Mechanicville is only about 43 inches.

SACANDAGA RIVER NEAR HOPE

Location.—About $11\frac{1}{2}$ miles below junction of east and west branches, $3\frac{1}{4}$ miles above Hope post-office, Hamilton county, and 12 miles above Northville.

Drainage area.—494 square miles (measured on topographic maps).

Records available.—September 15, 1911, to June 30, 1921.

Gage.—Staff in two sections on left bank, the lower inclined, the upper vertical; read by Melvin Willis.

Discharge measurements.—Made from cable 100 feet below gage, or by wading.

Channel and control.—Rocky, probably permanent.

Extremes of discharge.—Maximum stage recorded during year, 7.60 feet at 5:05 P. M., December 14 (discharge, 11,800 second-feet); minimum stage recorded, 1.50 feet at 7 A. M., September 30 (discharge, 71 second-feet).

1911–1921: Maximum stage recorded, 10.0 feet at 5:30 P. M. March 27, 1913 (discharge, 24,800 second-feet); minimum stage recorded, 1.17 feet at 7:55 A. M. September 30, 1913 (discharge, about 20 second-feet).

Ice.—Stage-discharge relation affected by ice.

Accuracy.—Stage-discharge relation permanent; affected by ice during much of the period December to March. Rating curve well defined between 60 and 10,000 second-feet. Gage read to hundredths twice daily. Daily discharge ascertained by applying mean daily gage height to rating table. Records good except during periods of estimate, which are fair.

Coöperation.—Station maintained by the United States Geological Survey in coöperation with the State Engineer and Surveyor.

Discharge measurements of SACANDAGA RIVER NEAR HOPE, during the year ending
June 30, 1921

DATE	Made by	Gage height	Discharge
		<i>Feet</i>	<i>Sec.-ft.</i>
Aug. 17.....	C. C. Covert.....	2.45	498
Nov. 19.....	Covert and Harrington.....	2.72	618

Daily discharge, in second-feet, of SACANDAGA RIVER NEAR HOPE, for the year ending
June 30, 1921

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	141	190	144	2,230	438	558	700	.....	.....	3,330	3,130	350
2.....	175	178	135	2,080	1,110	558	910	.....	.....	3,130	2,560	320
3.....	202	168	128	1,810	1,010	558	1,110	.....	.....	2,740	2,080	292
4.....	255	158	128	1,680	960	525	960	.....	.....	2,560	1,680	278
5.....	273	141	122	1,440	865	2,230	820	.....	.....	2,230	1,440	264
6.....	320	128	128	1,220	700	4,230	740	.....	1,440	1,940	1,220	264
7.....	320	119	135	1,010	590	1,330	.....	.....	1,940	1,810	1,110	247
8.....	292	141	125	865	590	525	.....	.....	2,930	1,680	1,010	230
9.....	269	128	119	740	660	525	.....	.....	4,480	1,560	910	217
10.....	247	190	122	660	1,010	465	.....	.....	5,790	1,440	820	205
11.....	230	465	260	558	910	421	.....	.....	5,790	1,220	740	213
12.....	230	590	247	465	740	390	.....	.....	5,250	1,110	700	310
13.....	350	820	238	454	700	375	.....	.....	5,790	1,060	660	400
14.....	320	820	225	421	590	4,990	.....	.....	6,930	1,110	700	454
15.....	287	660	242	400	590	8,490	.....	.....	7,530	1,280	625	370
16.....	269	590	230	370	558	4,230	.....	.....	8,830	1,560	590	273
17.....	247	438	217	350	590	3,330	.....	.....	8,830	2,230	535	230
18.....	225	340	190	320	590	2,740	.....	.....	7,530	2,560	495	217
19.....	421	310	178	301	590	1,680	.....	.....	4,990	1,940	465	198
20.....	495	273	168	273	525	1,440	.....	.....	6,350	1,680	421	194

Daily discharge, in second-feet, of SACANDAGA RIVER NEAR HOPE, for the year ending
June 30, 1921 — *Continued*

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
21.....	421	238	154	255	495	1,220	.....	.....	9,900	1,680	380	182
22.....	370	205	122	213	660	1,160	.....	.....	8,160	1,940	370	168
23.....	320	194	111	175	910	1,680	.....	.....	6,070	2,390	465	161
24.....	273	168	106	154	1,010	1,680	.....	.....	4,990	2,230	443	150
25.....	247	154	101	141	910	1,440	.....	.....	6,350	1,940	421	141
26.....	238	150	96	132	740	1,110	.....	.....	6,930	1,680	395	168
27.....	230	147	89	138	660	865	.....	.....	6,350	1,560	370	205
28.....	225	141	83	454	625	740	.....	.....	6,350	1,440	355	335
29.....	217	141	77	432	590	740	.....	.....	5,250	1,220	421	660
30.....	209	135	75	421	590	740	.....	.....	3,540	1,940	421	910
31.....	198	135	.....	405	.....	700	.....	.....	3,330	.....	385	.....

NOTE.—No gage-height record January 7 to March 5. Mean daily discharge January 7 to 31 estimated at 550 second-feet, February 1 to 28 at 550 second-feet and March 1 to 5 at 1,000 second-feet by comparison with Hadley record.

Monthly discharge of SACANDAGA RIVER NEAR HOPE, for the year ending June 30, 1921

[Drainage area, 494 square miles]

MONTH	DISCHARGE IN SECOND-FEET				RUN-OFF
	Maximum	Minimum	Mean	Per square mile	Depth in inches on drainage area
July.....	495	141	275	.557	.64
August.....	820	119	279	.565	.65
September.....	260	75	150	.304	.34
October.....	2,230	132	663	1.34	1.54
November.....	1,110	438	717	1.45	1.62
December.....	8,490	375	1,670	3.38	3.90
January.....	.....	.....	613	1.24	1.43
February.....	.....	.....	550	1.11	1.16
March.....	9,900	.....	5,050	10.22	11.78
April.....	3,330	1,060	1,870	3.79	4.23
May.....	3,130	355	849	1.72	1.98
June.....	910	141	287	.581	.65
The year.....	9,900	75	1,090	2.21	29.92

SACANDAGA RIVER AT HADLEY

Location.—About half a mile west of railroad station at Hadley, Saratoga county, 1 mile above mouth of river and $4\frac{1}{2}$ miles below site of proposed storage dam at Conklingville.

Drainage area.—1,060 square miles (measured on topographic maps).

Records available.—January 1, 1911, to June 30, 1921. September 13, 1907, to December 31, 1910, at upper bridge station; September 24, 1909, to midsummer of 1911, at lower bridge station.

Gage.—Gurley 7-day repeating graph water-stage recorder in a concrete shelter on the left bank. Recorder inspected by J. F. Kelly.

Discharge measurements.—Made from highway bridge one-half mile below gage, or by wading.

Channel and control.—Very rough but permanent.

Extremes of discharge.—Maximum stage during the year from water-stage recorder, 8.28 feet at noon March 23 (discharge, 11,800 second feet); minimum stage from water-stage recorder, 2.70 feet from midnight to 4 A. M. September 28 (discharge, 218 second-feet).

1911–1921: Maximum stage from water-stage recorder, 12.36 feet from 11 A. M. to noon March 28, 1913 (discharge, about 35,500 second-feet); minimum stage from water-stage recorder, 2.25 feet all day September 15, 1913 (discharge, about 61 second-feet).

Ice.—Stage-discharge relation affected by ice.

Accuracy.—Stage-discharge relation permanent; usually affected by ice during a large part of period from December to March. Rating curve well defined between 150 and 20,000 second-feet. Operation of water-stage recorder satisfactory throughout the year except for a few days. Daily discharge ascertained by applying to the rating table mean daily gage height determined by inspecting gage-height graph, or for days of considerable fluctuation by averaging discharge for intervals of the day.

Coöperation.—Station maintained by the United States Geological Survey in coöperation with the State Engineer and Surveyor.

No discharge measurements were made at this station during current year.

Daily discharge, in second-feet, of SACANDAGA RIVER AT HADLEY, for the year ending
June 30, 1921

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	395	552	223	2,420	928	1,800	1,610	1,040	838	6,550	4,100	668
2.....	387	683	361	3,660	901	3,750	1,640	1,100	882	6,000	4,700	594
3.....	913	645	355	3,350	1,310	4,460	2,110	876	1,180	5,470	4,620	519
4.....	956	548	328	2,780	2,350	4,460	2,520	919	1,700	4,820	4,460	486
5.....	882	474	297	2,190	2,270	4,700	2,520	882	2,110	4,340	3,880	486
6.....	738	418	278	1,620	1,890	5,730	2,350	910	2,270	3,990	3,250	566
7.....	608	378	273	1,270	1,530	6,270	1,950	956	2,870	3,560	2,520	449
8.....	573	355	297	1,030	1,350	6,000	1,680	966	3,880	3,150	1,520	407
9.....	637	328	302	864	1,220	4,950	1,680	1,220	4,950	2,870	1,320	378
10.....	722	323	307	738	1,440	4,340	1,430	919	6,140	2,690	1,260	353

Daily discharge, in second-feet, of SACANDAGA RIVER AT HADLEY, for the year ending
June 30, 1921 — *Continued*

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
11.....	808	361	323	637	2,060	3,770	1,520	864	7,430	2,430	1,250	350
12.....	519	1,030	361	573	2,030	3,060	1,800	873	10,000	2,190	1,150	401
13.....	832	1,740	443	532	1,700	2,520	1,800	936	10,000	1,950	1,110	665
14.....	1,100	1,550	587	493	1,400	3,490	1,290	847	10,000	1,760	1,400	698
15.....	976	2,450	615	474	1,230	7,740	1,020	986	10,000	1,700	1,440	615
16.....	938	1,780	539	455	1,140	10,000	1,060	864	10,000	2,110	1,230	519
17.....	804	1,380	493	430	1,080	10,000	1,140	947	10,800	2,870	1,070	443
18.....	645	1,010	455	412	1,280	8,370	1,140	1,160	11,500	3,660	956	389
19.....	722	821	412	407	1,460	6,840	1,330	1,570	10,400	3,990	864	381
20.....	1,540	690	361	401	1,440	5,340	1,390	1,320	9,030	3,880	795	339
21.....	1,650	594	323	395	1,390	4,460	1,320	1,350	9,030	3,560	738	307
22.....	1,160	506	302	384	1,320	3,560	1,420	1,130	10,400	3,060	675	283
23.....	928	461	278	366	1,900	3,350	1,430	1,020	11,500	2,870	637	273
24.....	804	430	258	250	3,350	3,560	1,200	966	10,460	3,150	630	263
25.....	714	389	245	344	3,350	3,060	1,110	1,160	9,370	3,560	630	268
26.....	622	344	236	339	3,060	2,030	1,150	938	9,710	3,460	738	263
27.....	545	312	227	344	2,890	1,800	1,150	858	10,000	3,150	873	263
28.....	486	283	254	639	2,350	1,560	1,240	812	9,710	2,780	778	312
29.....	430	278	372	1,370	2,030	1,800	1,010	.....	9,370	2,350	683	395
30.....	418	278	567	1,260	1,760	1,710	976	.....	8,370	2,000	668	714
31.....	412	297	.....	1,040	.....	1,680	976	.....	7,430	.....	778	.....

Monthly discharge of SACANDAGA RIVER AT HADLEY, for the year ending June 30, 1921
[Drainage area, 1,060 square miles]

MONTH	DISCHARGE IN SECOND-FEET				RUN-OFF Depth in inches on drainage area
	Maximum	Minimum	Mean	Per square mile	
July.....	1,650	387	763	.720	.83
August.....	2,450	278	700	.660	.76
September.....	615	227	369	.330	.38
October.....	3,660	330	1,020	.962	1.11
November.....	3,350	901	1,770	1.67	1.86
December.....	10,000	1,560	4,390	4.14	4.77
January.....	2,520	976	1,430	1.40	1.61
February.....	1,570	812	1,020	.962	1.00
March.....	11,500	838	7,460	7.04	8.12
April.....	6,550	1,700	3,350	3.16	3.53
May.....	4,820	630	1,640	1.55	1.79
June.....	714	263	433	.408	.46
The year.....	11,500	227	2,050	1.93	26.22

HOOSIC RIVER DESCRIPTION

Hoosic river has its sources on the west slope of the Hoosic mountains in Vermont and Massachusetts. Two head branches, one flowing southward, the other northward along the west slope of this range, unite at North Adams, Mass., and the stream then

flows northwestward, entering the Hudson three miles north of Mechanicville. Above Buskirk the drainage basin is rugged and precipitous, the distribution of tributaries affording rapid concentration of the run-off from the steep rock slopes. The ridges are sparsely wooded. The soil in the valleys is generally firm and tenacious. The general elevation of the valley at the junction of the headwaters is 1,000 feet. Numerous dams, affording power for textile, agricultural implement and other industries, are scattered throughout the length of the stream from North Adams to Schaghticoke. The drainage basin contains no important lakes and but one storage reservoir, that at Farnum, near the head of the south branch.

HOOSICK RIVER NEAR EAGLE BRIDGE

Location.—Half a mile below Walloomsac river and $1\frac{1}{2}$ miles above Owl Kill and Eagle Bridge, Rensselaer county.

Drainage area.—512 square miles (measured on topographic maps).

Records available.—August 13, 1910, to June 30, 1921.

Gage.—chain gage on left bank near the farmhouse of James Russell about $1\frac{1}{2}$ miles above Eagle Bridge. Gage read by Dennis Mironowicz and Michael Murrane.

Discharge measurements.—Made from cable half a mile below gage, or by wading.

Channel and control.—Gravel; somewhat shifting.

Extremes of discharge.—Maximum stage recorded during year, 11.05 feet at 7 A. M. March 22 (discharge, 11,300 second-feet); minimum stage recorded, 2.45 feet at 7 A. M. September 5 (discharge, 91 second-feet).

1910–1921: Maximum stage recorded, 13.5 feet at 7:30 A. M. July 9, 1915 (discharge, about 16,700 second-feet); minimum stage recorded, 6.1 feet (old datum) at 5 P. M. September 14, 1913 (discharge, practically zero).

Ice.—Stage-discharge relation affected by ice during most years.

Regulation.—Flow affected by storage on Walloomsac river and at Hoosick Falls about 2 miles above gage.

Accuracy.—Stage-discharge relation practically permanent during the year except as affected by ice during most of period January to March. Rating curve well defined between 150 and 9,000 second-feet. Gage read to half-tenths twice daily. Daily discharge ascertained by applying mean daily gage height to rating table. Records good, except for periods of low water, when semi-daily gage heights may not indicate the true mean, owing to

abnormal fluctuation in stage, and for periods of ice effect, for which they are fair.

Coöperation.—Station maintained by the United States Geological Survey in coöperation with the State Engineer and Surveyor.

Discharge measurements of HOOSIC RIVER NEAR EAGLE BRIDGE, during the year ending June 30, 1921

DATE	Made by	Gage height	Discharge
		<i>Feet</i>	<i>Sec.-ft.</i>
July 9.....	Shupe and Currier.....	3.41	363
Aug. 25.....	S. M. Currier.....	3.16	298
Aug. 25.....	S. M. Currier.....	3.14	262
Feb. 3.....	E. B. Shupe.....	a 3.88	414
Feb. 19.....	E. B. Shupe.....	3.65	548
April 30.....	Tuttle and Riddle b.....	4.54	1,010

a Backwater from ice.

b Students of Rensselaer Polytechnic Institute under supervision of E. B. Shupe.

Daily discharge, in second-feet, of HOOSIC RIVER NEAR EAGLE BRIDGE, for the year ending June 30, 1921

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	360	320	382	8,020	582	1,100	765	500	1,280	.....	1,990	340
2.....	285	405	320	2,690	730	4,450	1,370	460	1,670	.....	1,880	320
3.....	268	250	250	1,470	4,600	2,810	1,570	400	2,100	.....	1,370	285
4.....	382	220	214	1,100	1,680	2,100	1,190	380	1,470	.....	1,020	340
5.....	320	220	124	980	1,190	3,590	1,370	420	870	.....	1,100	450
6.....	340	220	145	905	940	8,620	1,100	1,300	1,020	.....	940	320
7.....	382	185	250	870	905	4,010	1,020	700	2,330	.....	940	360
8.....	382	170	235	610	940	2,570	940	550	2,570	.....	800	185
9.....	235	152	220	528	800	1,880	730	500	4,750	.....	700	155
10.....	250	428	205	450	1,020	2,100	582	440	8,620	.....	405	136
11.....	220	940	428	405	870	1,990	640	440	4,750	.....	670	180
12.....	250	610	320	450	730	1,670	730	420	2,690	.....	405	250
13.....	405	800	640	450	670	1,470	582	420	3,320	.....	555	235
14.....	268	1,470	730	380	582	2,210	600	400	3,190	.....	870	193
15.....	250	1,670	555	405	640	6,710	1,900	500	2,330	.....	582	160
16.....	250	940	285	320	610	3,320	1,000	750	2,570	.....	555	180
17.....	235	700	380	382	870	2,450	700	2,800	2,690	.....	428	202
18.....	205	670	380	475	1,100	2,100	500	1,100	2,100	.....	382	132
19.....	320	555	340	320	835	1,670	460	610	1,570	.....	382	116
20.....	670	405	382	360	730	1,470	550	405	3,060	.....	360	142
21.....	360	360	250	302	670	1,280	650	528	3,190	.....	340	150
22.....	268	360	235	285	640	1,100	750	610	2,690	.....	268	150
23.....	220	405	250	285	4,450	1,280	700	500	1,670	.....	382	142
24.....	235	235	250	220	4,750	1,280	550	500	1,470	.....	320	142
25.....	250	220	235	220	2,690	870	300	555	2,570	.....	235	150
26.....	382	220	130	360	2,210	670	500	500	2,690	.....	405	108
27.....	285	220	205	405	1,570	700	550	320	2,570	.....	382	610
28.....	220	196	196	765	1,470	835	480	1,100	1,990	.....	285	610
29.....	250	152	285	730	1,190	870	420	.....	1,770	.....	235	405
30.....	250	120	670	610	730	870	400	.....	1,570	.....	905	1,990
31.....	220	205	.....	475	.....	800	480	.....	1,470	.....	1,190	.....

NOTE.—Discharge, January 14 to February 17, determined from gage-heights corrected for ice effect from one discharge measurement, study of weather records and comparison with record of Sacandaga river at Hadley. Mean daily discharge April 1 to 30 estimated at 1,270 second-feet by comparison with record of Sacandaga river at Hadley; no gage-height record.

Monthly discharge of HOOSIC RIVER NEAR EAGLE BRIDGE, for the year ending June 30, 1921

[Drainage area, 512 square miles]

MONTH	DISCHARGE IN SECOND-FEET				RUN-OFF
	Maximum	Minimum	Mean	Per square mile	Depth in inches on drainage area
July	670	220	297	.580	.67
August	1,670	120	452	.883	1.02
September	730	124	315	.615	.69
October	8,020	220	845	1.65	1.90
November	4,750	582	1,390	2.71	3.02
December	8,620	670	2,220	4.34	5.00
January	1,900	300	777	1.52	1.75
February	2,800	320	647	1.26	1.31
March	8,620	870	2,540	4.96	5.72
April . . . . .	.....	.....	1,270	2.48	2.77
May	1,990	235	686	1.34	1.54
June	1,990	198	395	.596	.66
The year	8,620	108	983	1.92	26.05

HOOSIC RIVER AT SCHAGHTICOKE

Location.—At the Sehenectady Power Company's dam in the village of Schaghticoke.

Drainage area.—635 square miles.

Records available.—December 1, 1908, to June 30, 1921.

Gages.—Long distance water-stage recorder which indicates in the power house the elevation of the water surface in the forebay. Staff gage in forebay at end of the canal.

Discharge.—Discharge estimates based on the flow over the dam and the flow through the wheels estimated from hourly readings reduced by curves furnished by water-wheel manufactures, based upon tests after installation. There are four radial inward flow Francis type wheels manufactured by Pelton, each 5,000 horsepower.

Extremes of discharge.—1908–1921: Maximum daily discharge, 17,190 second-feet, February 20, 1909. Minimum daily discharge, 0 second-feet on several different days.

Regulation.—During low stages discharge appreciably affected by local storage at power-plants above station.

Coöperation.—Discharge records furnished by the Adirondack Power and Light Corporation.

GAGING OF STREAMS: HUDSON RIVER BASIN 173

Daily discharge of HOOSIC RIVER AT SCHAGHTICOKE, for the year ending June 30, 1921

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June.
1.....	371	316	351	3,123	500	3,947	692	303	1,733	5,121	1,999	374
2.....	449	360	201	2,346	1,231	4,496	915	354	1,689	3,794	2,653	272
3.....	422	256	260	2,143	5,107	3,989	1,748	335	2,827	2,769	1,932	257
4.....	303	232	158	1,517	3,057	4,852	1,195	336	1,300	2,089	1,350	266
5.....	308	221	28	927	2,051	6,466	1,077	792	1,026	1,706	1,442	135
6.....	427	196	0	876	1,308	6,967	1,079	1,230	1,314	1,566	1,450	290
7.....	276	149	271	747	976	5,989	945	579	2,287	1,204	937	196
8.....	264	19	154	650	876	4,950	834	265	2,492	1,445	732	194
9.....	340	210	179	598	1,004	3,444	740	325	2,987	1,378	868	173
10.....	309	280	412	489	1,134	2,978	710	358	4,364	1,403	1,296	80
11.....	0	1,056	403	487	804	2,856	367	372	3,084	2,136	631	127
12.....	366	431	312	406	699	2,084	427	425	3,854	1,223	601	78
13.....	480	717	857	389	639	1,944	479	312	3,854	1,003	586	237
14.....	365	1,107	647	325	509	3,913	1,235	300	2,934	1,006	818	220
15.....	273	985	451	356	600	4,460	1,778	229	4,183	1,241	524	140
16.....	285	702	388	495	690	3,997	826	1,171	4,740	2,023	535	0
17.....	298	666	393	225	1,198	3,816	519	1,174	4,792	1,361	494	55
18.....	107	530	336	580	965	2,807	284	1,040	2,275	2,123	367	103
19.....	451	469	251	335	883	2,693	343	637	1,882	2,162	366	19
20.....	730	449	260	360	882	2,465	534	169	1,900	2,050	324	61
21.....	336	416	312	392	644	1,906	639	288	4,191	1,685	304	115
22.....	313	255	232	368	894	1,512	786	289	4,314	1,429	209	104
23.....	277	328	276	277	4,850	2,495	670	388	1,908	1,181	311	186
24.....	432	265	248	199	3,845	2,294	441	269	1,893	1,641	401	190
25.....	318	204	202	209	3,936	1,081	10	200	1,996	2,056	246	104
26.....	429	215	0	363	2,727	835	282	257	2,461	2,040	451	34
27.....	345	260	209	877	2,556	820	320	243	1,933	1,828	361	114
28.....	285	206	350	1,032	2,347	853	290	1,376	2,317	1,574	335	160
29.....	193	0	450	721	1,602	882	474	.....	2,117	1,258	463	985
30.....	207	144	2,850	534	2,006	831	349	.....	1,434	801	705	1,369
31.....	226	331	.....	360	.....	925	376	.....	3,141	.....	462	.....

Monthly discharge of HOOSIC RIVER AT SCHAGHTICOKE, for the year ending June 30, 1921

[Drainage area, 635 square miles]

MONTH	DISCHARGE IN SECOND-FEET				RUN-OFF Depth in inches on drainage area
	Maximum	Minimum	Mean	Per square mile	
July.....	730	0	331	0.522	0.601
August.....	1,107	0	386	0.608	0.700
September.....	2,850	0	381	0.599	0.669
October.....	3,123	199	714	1.125	1.296
November.....	5,107	500	1,690	2.660	2.968
December.....	6,967	820	3,020	4.753	5.480
January.....	1,778	10	690	1.086	1.252
February.....	1,376	169	502	0.790	0.821
March.....	4,864	1,029	2,682	4.221	4.870
April.....	5,121	801	1,813	2.854	3.190
May.....	2,653	209	778	1.225	1.413
June.....	1,369	0	217	0.342	0.382
The year.....	6,967	0	1,100	1.732	23.642

MOHAWK RIVER

The Mohawk river rises in the northern part of Oneida county and flows in an easterly direction, entering the Hudson river at Cohoes. Its total length is about 140 miles. Considerable water is diverted to this river from the Black river, during the navigation season, through the Black River canal. Water is diverted from the Mohawk to the Oswego basin through the summit level of the Barge canal at Rome. Below Utica the greater portion of the river is made navigable by the Barge canal improvement. Of the 535 feet of fall between the crest of the Delta dam and the mouth of the river at Cohoes but about 180 is at present utilized for power development.

Two large storage reservoirs have been constructed to feed water into the summit level of the Barge canal. The Delta reservoir is on the Mohawk river 6 miles above the city of Rome. It has a capacity of 2,750,000,000 cubic feet. The dam is a concrete structure with an ogee crest 300 feet long at elevation 550.0. There are four 60-inch pipes to pass water downstream and a 30-inch pipe line to supply water to the Black River canal. The reservoir when full has an area of about $4\frac{1}{3}$ square miles.

The Hinckley reservoir is on the West Canada creek at Hinckley. The dam consists of earth dykes with concrete core and a concrete spillway with an ogee crest 400 feet long at elevation 1,225.0. At the north end of the spillway are four 60-inch discharge pipes at elevation 1,169.5. At the south end are two 42-inch pipes at elevation 1,164.25 for the use of the Consolidated Water Company, which diverts water at this point to Utica. The reservoir has a capacity of 3,445,000,000 cubic feet and a water-surface area of about 4.46 square miles at crest elevation. Water is diverted from the West Canada creek just below Trenton Falls through a feeder canal to Nine Mile creek and thence to the Barge canal.

The principal tributaries of the Mohawk below the source are, successively, Oriskany, West Canada, East Canada and Schoharie creeks.

Drainage areas of MOHAWK RIVER AND TRIBUTARIES
(From U. S. G. S. topographic maps)

LIMITS	AREA IN SQUARE MILES			
	Place to place	Sub-total	Branch total	Total
<i>Lansingkill</i>				
Source to junction with West branch.....	29.41	.....	29.41	.....
MOHAWK RIVER				
Source of West branch to junction with East branch.....	19.25	19.25	.....	.....
Source of East branch to junction with West branch.....	15.16	34.41	.....	.....
Junction of East and West branches to and including first large creek to north.....	5.86	40.27	.....	.....
First creek below junction to and including second large creek to north.....	6.08	46.35	.....	.....
Second creek below junction to junction of Lansingkill, Hillside.....	3.40	49.75	49.75	79.16
Junction at Hillside to mouth of Stringer brook..	1.17	.....	.....	80.33
<i>Stringer Brook</i>				
Source to mouth.....	13.43	.....	13.43	93.76
MOHAWK RIVER				
Junction of Stringer brook to mouth of Big brook (Frenchville).....	3.02	.....	.....	96.78
<i>Big Brook</i>				
Source to mouth.....	22.86	.....	22.86	119.64
MOHAWK RIVER				
Junction of Big brook (Frenchville) to State feeder dam at Delta (now submerged).....	16.25	.....	.....	135.89
State feeder dam at Delta to highway bridge below new Delta dam.....	11.97	.....	.....	147.86
Highway bridge below new Delta dam to Ridge Mills dam.....	7.74	.....	.....	155.60
Ridge Mills dam to Floyd Ave. bridge.....	2.59	.....	.....	158.19
Floyd Ave. bridge to State dam at Rome.....	2.55	.....	.....	160.74
State dam at Rome to mouth of Six-Mile creek..	26.40	.....	.....	187.14
<i>Six-Mile Creek (Oneida Co.)</i>				
Source to mouth.....	14.94	.....	14.94	202.08
MOHAWK RIVER				
Mouth of Six-Mile creek to mouth of Nine-Mile creek.....	5.29	.....	.....	207.37
<i>Nine-Mile Creek</i>				
Source to South Trenton.....	19.62	.....	.....	.....
South Trenton to crossing of 700-foot contour....	6.54	26.16	.....	.....
Crossing of 700-foot contour to first bridge above Holland Patent.....	2.49	28.65	.....	.....
First bridge above Holland Patent to first bridge below Holland Patent.....	12.71	41.36	.....	.....
First bridge below Holland Patent to Stittville.....	6.12	47.48	.....	.....
Stittville to first bridge below Stittville (Powell's bridge).....	11.59	59.07	.....	.....
Powell's bridge to third bridge below Stittville...	10.34	69.41	.....	.....
Third bridge below Stittville to mouth.....	0.79	70.20	70.20	277.57
MOHAWK RIVER				
Mouth of Nine-Mile creek to mouth of Oriskany creek.....	6.19	.....	.....	283.76
<i>Areas diverted from Chenango river basin *</i>				
Chenango river from source to junction with Eaton brook at Eaton.....	25.25	.....	.....	25.25
Eaton brook from source to Eaton reservoir dam.....	9.16	9.16	.....	.....
Eaton reservoir dam to junction with Chenango river at Eaton.....	6.69	15.85	15.85	41.10

* Not included in totals for Mohawk river areas.

Drainage areas of MOHAWK RIVER AND TRIBUTARIES — Continued
(From U. S. G. S. topographic maps)

LIMITS	AREA IN SQUARE MILES			
	Place to place	Sub-total	Branch total	Total
<i>Areas diverted from Chenango river basin — Cont'd</i>				
Chenango river, junction Eaton brook to head of feeder canal.....	2.99	.....	.....	44.09
Bradley brook from source to Bradley reservoir dam.....	3.04	.....	.....	.....
Bradley reservoir dam to head of feeder canal....	4.57	7.61	.....	.....
Kingsley brook from source to Kingsley reservoir dam.....	5.12	.....	.....	.....
Kingsley reservoir dam to junction with Bradley brook feeder canal.....	1.75	6.87	14.48	58.57
Head of feeder, Chenango river to junction of feeders, Woodman pond.....	2.04	.....	.....	60.61
Payne brook from source to Madison reservoir dam.....	8.73	.....	.....	.....
Madison reservoir dam to junction of feeders, Woodman pond.....	2.04	10.77	10.77	71.38
Junction of feeders, Woodman pond to junction with Leland pond outlet.....	3.26	.....	.....	74.64
Source, Leland creek to canal reservoir dam.....	6.74	.....	.....	81.38
Junction with Leland pond outlet to natural watershed limits.....	6.53	.....	.....	87.91
<i>Oriskany Creek</i>				
Source of Oriskany creek to bridge at Solville....	7.84	.....	.....	.....
Solville to Oriskany Mills.....	13.27	21.11	.....	.....
Oriskany Mills to junction with Big creek, Oneida county (Deansboro).....	16.54	37.65	.....	.....
Source of Big creek to junction with Oriskany creek (Deansboro).....	20.32	57.97	.....	.....
Junction with Big creek to Farmers Mills.....	14.09	72.06	.....	.....
Farmers Mills to Clinton.....	11.11	83.17	.....	.....
Clinton to Kirkland.....	4.73	87.90	.....	.....
Kirkland to dam above Clark Mills.....	5.76	93.66	.....	.....
Dam above Clark Mills to Walesville.....	9.92	103.58	.....	.....
Walesville to Colemans.....	36.99	140.57	.....	.....
Colemans to State dam above Oriskany.....	5.47	146.04	.....	.....
State dam above Oriskany to mouth of Oriskany creek.....	0.78	146.82	146.82	430.58
<i>MOHAWK RIVER</i>				
Mouth of Oriskany creek to mouth of Sauquoit creek.....	15.68	.....	.....	446.26
<i>Sauquoit Creek</i>				
Source of Sauquoit creek to Cassville.....	7.17	.....	.....	.....
Cassville to dam at Clayville.....	4.71	11.88	.....	.....
Dam at Clayville to dam at Sauquoit.....	12.54	24.42	.....	.....
Dam at Sauquoit to dam above Chadwick.....	4.28	28.70	.....	.....
Dam above Chadwick to 700-foot contour at Willowvale.....	3.72	32.42	.....	.....
700-foot contour at Willowvale to dam at Washington Mills.....	11.37	43.79	.....	.....
Dam at Washington Mills to dam above New Hartford.....	2.92	46.71	.....	.....
Dam above New Hartford to dam at Capron....	1.52	48.23	.....	.....
Dam at Capron to dam below Capron.....	2.20	50.43	.....	.....
Dam below Capron to upper dam at New York Mills.....	0.49	50.92	.....	.....
Upper dam at New York Mills to mouth of Sauquoit creek.....	14.58	65.50	65.50	511.76
<i>MOHAWK RIVER</i>				
Mouth of Sauquoit creek to Black River R. R. bridge at Utica.....	13.09	.....	.....	524.85
Black River R. R. bridge at Utica to mouth of Reels creek.....	2.70	.....	.....	527.55
<i>Reels Creek</i>				
Source to mouth.....	9.60	.....	9.60	537.24

Drainage areas of MOHAWK RIVER AND TRIBUTARIES — *Continued*
(From U. S. G. S. topographic maps)

LIMITS	AREA IN SQUARE MILES			
	Place to place	Sub-total	Branch total	Total
<i>Ballou Creek</i>				
Source to mouth.....	4.57	.....	4.57	541.81
<i>MOHAWK RIVER</i>				
Mouth of Ballou creek to mouth of Starch Factory creek.....	1.99	.....	.....	543.80
<i>Starch Factory Creek</i>				
Source to mouth.....	7.22	.....	.....	551.02
<i>MOHAWK RIVER</i>				
Mouth of Starch Factory creek to mouth of Sterling creek.....	30.93	.....	.....	581.95
<i>Sterling Creek</i>				
Source to mouth.....	19.94	.....	.....	601.89
<i>MOHAWK RIVER</i>				
Mouth of Sterling creek to mouth of Moyer creek.....	14.85	.....	.....	616.74
<i>Moyer Creek</i>				
Source to mouth.....	21.66	.....	.....	638.40
<i>MOHAWK RIVER</i>				
Mouth of Moyer creek to mouth of Steels creek..	7.30	.....	.....	645.70
<i>Steels Creek</i>				
Source to mouth.....	29.54	.....	.....	675.24
<i>MOHAWK RIVER</i>				
Mouth of Steels creek to Mohawk-Herkimer road bridge.....	33.07	.....	.....	708.31
Mohawk-Herkimer road bridge to mouth of West Canada creek.....	7.51	.....	.....	715.82
<i>West Canada Creek *</i>				
Source to mouth.....	583.64	.....	.....	1,299.46
<i>MOHAWK RIVER</i>				
Mouth of West Canada creek to State dam at Little Falls.....	26.07	.....	.....	1,325.53
State dam at Little Falls to Gilberts dam.....	4.20	.....	.....	1,329.73
Gilberts dam to Rocky Rift feeder dam.....	11.82	.....	.....	1,341.55
<i>Crum Creek</i>				
Source to mouth.....	11.40	.....	.....	1,352.95
<i>MOHAWK RIVER</i>				
Mouth of Crum creek (feeder dam) to mouth of Nowadaga creek.....	0.27	.....	.....	1,353.22
<i>Nowadaga Creek</i>				
Source to mouth.....	32.43	.....	.....	1,385.65
<i>MOHAWK RIVER</i>				
Mouth of Nowadaga creek to mouth of East Canada creek.....	4.65	.....	.....	1,390.30
<i>East Canada Creek *</i>				
Source to mouth.....	a 281.81	.....	.....	a 1,672.11
<i>MOHAWK RIVER</i>				
Mouth of East Canada creek to mouth of East Crum creek.....	0.59	.....	.....	a 1,672.70
<i>East Crum Creek</i>				
Source to mouth.....	15.55	.....	.....	a 1,688.25

* For subareas, see separate table following. a Corrected for error of 0.2 noted in Report of State Engineer and Surveyor for 1916, Vol. II, pages 322 and 325.

Drainage areas of MOHAWK RIVER AND TRIBUTARIES — Continued
(From U. S. G. S. topographic maps)

LIMITS	AREA IN SQUARE MILES			
	Place to place	Sub-total	Branch total	Total
MOHAWK RIVER				
Mouth of East Crum creek to mouth of Timmerman creek.....	3.31	.....	.....	a 1,691.66
<i>Zimmerman Creek</i>				
Source to mouth.....	16.38	.....	.....	a 1,707.94
MOHAWK RIVER				
Mouth of Timmerman creek to mouth of Zimmerman creek.....	0.52	.....	.....	a 1,708.46
<i>Zimmerman Creek</i>				
Source to mouth.....	14.63	.....	.....	a 1,723.09
MOHAWK RIVER				
Mouth of Zimmerman creek to St. Johnsville bridge.....	0.54	.....	.....	a 1,723.63
St. Johnsville bridge to mouth of Garoga creek....	12.05	.....	.....	a 1,735.68
<i>Garoga Creek</i>				
Source of Garoga creek to foot of East Garoga lake.....	10.44	.....	.....	.....
Foot of East Garoga lake to foot of pond, Newkirk Mills.....	3.18	13.62	.....	.....
Foot of pond, Newkirk Mills, to junction with Peck lake outlet.....	9.11	22.73	22.73	.....
Source to Woodworth lake to foot of Peck lake....	16.29	.....	.....	.....
Foot of Peck lake to junction with Garoga creek....	4.52	20.81	43.54	.....
Junction with Peck lake outlet to Rockwood.....	7.20	.....	50.74	.....
Rockwood to Garoga.....	2.19	.....	52.93	.....
Garoga to mouth of Sprite creek.....	4.99	.....	57.92	.....
Source of Sprite creek to mouth.....	14.13	.....	72.05	.....
Mouth of Sprite creek to fourth highway bridge above mouth.....	13.19	.....	85.24	.....
Fourth highway bridge above mouth to second highway bridge above mouth.....	7.78	.....	93.02	.....
Second highway bridge above mouth to first highway bridge above mouth.....	1.17	.....	94.19	.....
First highway bridge above mouth to mouth of Garoga creek.....	0.51	.....	94.70	a 1,830.38
MOHAWK RIVER				
Mouth of Garoga creek to Fort Plain.....	12.70	.....	.....	a 1,843.06
Fort Plain to Canajoharie.....	67.92	.....	.....	a 1,911.00
<i>Canajoharie Creek</i>				
Source to mouth.....	69.22	.....	69.22	a 1,980.22
MOHAWK RIVER				
Canajoharie to Sprakers.....	9.94	.....	.....	a 1,990.16
<i>Flat Creek</i>				
Source to mouth.....	49.11	.....	49.11	a 2,039.27
MOHAWK RIVER				
Sprakers to mouth of Yatesville creek.....	17.56	.....	.....	a 2,056.83
<i>Yatesville Creek</i>				
Source to mouth.....	12.71	.....	12.71	a 2,069.54
MOHAWK RIVER				
Mouth of Yatesville creek to mouth of Cayadutta creek.....	24.48	.....	.....	a 2,094.02

a Corrected for error of 0.2 noted in Report of State Engineer and Surveyor for 1916, Vol. II, pages 322 and 325.

Drainage areas of MOHAWK RIVER AND TRIBUTARIES — *Concluded*
(From U. S. G. S. topographic maps)

LIMITS	AREA IN SQUARE MILES			
	Place to place	Sub-total	Branch total	Total
<i>Cayadutta Creek</i>				
Source of Cayadutta creek to Johnstown (Main street bridge).....	35.16	.....	.....	.....
Johnstown (Main street bridge) to dam above Sammonsville.....	2.84	38.00	.....	.....
Dam above Sammonsville to dam at Sammonsville.....	3.53	41.53	.....	.....
Dam at Sammonsville to dam two miles below Sammonsville.....	16.44	57.97	.....	.....
Dam below Sammonsville to mouth of Cayadutta creek.....	5.06	63.03	63.03	a 2,157.05
MOHAWK RIVER				
Mouth of Cayadutta creek to Fultonville bridge..	0.68	.....	.....	a 2,157.73
Fultonville bridge to mouth of Schoharie creek..	47.39	.....	.....	a 2,205.12
<i>Schoharie Creek *</i>				
Source to mouth.....	b 929.88	.....	.....	b 3,135.00
MOHAWK RIVER				
Mouth of Schoharie creek to mouth of Chuctanunda creek (Amsterdam).....	31.54	.....	.....	b 3,166.54
<i>South Chuctanunda Creek</i>				
Source to Minville.....	22.62	22.62	.....	.....
Minville to mouth.....	10.41	33.03	33.03	b 3,195.57
<i>North Chuctanunda Creek</i>				
Source to dam, Amsterdam reservoir.....	8.76	8.76	.....	.....
Dam, Amsterdam reservoir to Hagaman.....	20.77	29.53	.....	.....
Hagaman to Rockton.....	4.11	33.64	.....	.....
Rockton to mouth.....	5.58	39.22	39.22	b 3,238.79
MOHAWK RIVER				
Amsterdam to Hoffman Ferry.....	43.59	.....	.....	b 3,282.38
Hoffman Ferry to Scotia bridge.....	52.44	.....	.....	b 3,334.82
Scotia bridge to mouth of Alplaus kill.....	24.37	.....	.....	b 3,359.19
<i>Alplaus Kill</i>				
Source to mouth.....	55.80	.....	55.80	b 3,414.99
MOHAWK RIVER				
Mouth of Alplaus kill to Vischer Ferry dam.....	12.21	.....	.....	b 3,427.20
Vischer Ferry dam to Crescent dam.....	66.13	.....	.....	b 3,493.33
Crescent dam to Cohoes Co.'s dam.....	0.61	.....	.....	b 3,493.94
Cohoes Co.'s dam to mouth of Mohawk river....	12.68	.....	.....	b 3,506.62

* For subareas, see table following. a Corrected for error of 0.2 noted in Report of State Engineer and Surveyor for 1916, Vol. II, pages 322 and 325. b These areas have been revised as the result of a joint determination of drainage areas of Schoharie creek, based on independent computations by the engineers of the Board of Water Supply of the city of New York and of the Department of State Engineer, and are also corrected for the error of 0.2 noted in Report of State Engineer and Surveyor for 1916, Vol. II, pages 322 and 325.

Drainage areas of WEST CANADA CREEK
(From U. S. G. S. topographic maps)

LIMITS	AREA IN SQUARE MILES			
	Place to place	Sub-total	Branch total	Total
WEST CANADA CREEK				
Source to outlet of Mud lake.....	18.05	.....	.....	18.05
Outlet of Mud lake to Swanson dam.....	28.77	.....	.....	46.82
Swanson dam to Honnedaga brook.....	46.82	.....	.....	93.64
Honnedaga Brook				
Honnedaga lake above outlet.....	5.40	.....	.....	.....
Lake to mouth.....	11.90	.....	17.30	110.94
WEST CANADA CREEK				
Honnedaga brook to South branch.....	30.46	.....	.....	141.40
South Branch, West Canada Creek				
Source to Mountain House.....	34.40	.....	.....	.....
Mountain House to mouth.....	19.25	.....	53.65	195.05
WEST CANADA CREEK				
South branch to Four-Mile brook (Wilmurt bridge).....	2.58	.....	.....	197.63
Four-Mile Brook				
Source to mouth.....	.....	.....	26.17	223.80
WEST CANADA CREEK				
Four-Mile brook to Black creek.....	36.92	.....	.....	260.72
Black Creek				
Source through Hall Vly.....	8.40	.....	.....	.....
Hall Vly to Bennett's mill (first bridge above Gray).....	16.30	.....	24.70	.....
Bennett's mill to Gray.....	4.50	.....	29.20	.....
Gray to North branch (first bridge below Gray).....	3.00	.....	32.20	.....
North Branch, Black Creek				
Source to Bull Hill road (contour 1,520).....	6.80	.....	.....	.....
Bull Hill road to Mill creek.....	4.00	10.80	.....	.....
Mill creek:				
Source through Cranberry lake and swamp.....	11.00	.....	.....	.....
Foot of Cranberry swamp to mouth.....	6.20	17.20	.....	.....
Total, North branch, Black creek, to Mill creek, inclusive.....	.....	28.00	.....	.....
North Branch, Black Creek				
Mill creek to mouth.....	0.85	28.85	61.05	.....
Black Creek				
North branch to Mounts creek.....	0.17	.....	61.22	.....
Mounts Creek				
Source to Gray-Wilmurt road (Radley).....	13.25	.....	.....	.....
Gray-Wilmurt road to mouth.....	2.10	15.35	76.57	.....
Black Creek				
Mounts creek to second bridge below Gray.....	1.55	.....	78.12	.....
Second bridge to third bridge below Gray.....	5.65	.....	83.77	.....
Third bridge to fourth bridge below Gray.....	12.35	.....	96.12	.....
Fourth bridge to Pardeville bridge.....	4.00	.....	100.12	.....
Pardeville bridge to Grant c.....	1.95	.....	102.07	.....
Grant to West Canada creek c.....	1.15	.....	103.22	363.94
WEST CANADA CREEK				
Black creek to Twin Rock bridge c.....	0.50	.....	.....	364.44
Twin Rock bridge to Hinkley dam c.....	8.50	.....	.....	372.94
Hinkley dam to Prospect.....	2.00	.....	.....	374.94
Prospect to Trenton Falls.....	0.90	.....	.....	375.84
Trenton Falls to Steuben creek.....	6.20	.....	.....	382.04
Steuben Creek				
Source to mouth.....	.....	.....	52.30	434.34

c Creek drowned out by reservoir.

Drainage areas of WEST CANADA CREEK — *Continued*

(From U. S. G. S. topographic maps)

LIMITS	AREA IN SQUARE MILES			
	Place to place	Sub-total	Branch total	Total
WEST CANADA CREEK				
Steuben creek to Poland (first bridge below).....	35.80	.....	.....	470.14
Poland to Newport.....	10.00	.....	.....	480.14
Newport to Middleville.....	47.20	.....	.....	527.34
Middleville to Kast bridge.....	47.50	.....	.....	574.84
Kast bridge to mouth.....	8.80	.....	.....	583.64

Drainage areas of EAST CANADA CREEK

(From U. S. G. S. topographic maps)

LIMITS	AREA IN SQUARE MILES			
	Place to place	Sub-total	Branch total	Total
EAST CANADA CREEK				
Above Oregon.....	40.13	.....	.....	40.13
Oregon to junction with North creek.....	10.42	.....	.....	50.55
<i>North Creek</i>				
Source to junction with East Canada creek.....	18.60	.....	18.60	69.15
EAST CANADA CREEK				
Junction with North creek to junction with Trammel creek.....	8.63	.....	.....	77.78
<i>Trammel Creek</i>				
Source to junction with East Canada creek.....	12.04	.....	.....	89.82
EAST CANADA CREEK				
Junction with Trammel creek to junction with Ayers creek (Stratford).....	0.20	.....	.....	90.02
<i>Ayers Creek</i>				
Source to junction with East Canada creek.....	13.63	.....	.....	103.65
EAST CANADA CREEK				
Junction with Ayers creek (Stratford) to Emmonsburg.....	8.05	.....	.....	111.70
Emmonsburg to junction with Big Sprite creek..	15.68	.....	.....	127.38
<i>Big Sprite Creek</i>				
Source to Stewart landing.....	40.90	.....	.....	.....
Stewart landing to junction with East Canada creek.....	7.87	.....	48.77	176.15
EAST CANADA CREEK				
Junction with Big Sprite creek to junction with Middle Sprite creek.....	3.70	.....	.....	179.85
<i>Middle Sprite Creek</i>				
Source to junction with East Canada creek.....	22.65	.....	.....	202.50
EAST CANADA CREEK				
Junction with Middle Sprite creek to junction with Spruce creek.....	0.20	.....	.....	202.70

Drainage areas of EAST CANADA CREEK — *Continued*

(From U. S. G. S. topographic maps)

LIMITS	AREA IN SQUARE MILES			
	Place to place	Sub-total	Branch total	General total
<i>Spruce Creek</i>				
Source to dam at Diamond Hill.....	36.20	36.20	.....	a 253.18
Dam at Diamond Hill to Salisbury.....	13.08	49.28	.....	.....
Salisbury to junction with East Canada creek....	1.20	.....	50.48	.....
<i>EAST CANADA CREEK</i>				
Junction with Spruce creek to lower bridge, Dolgeville.....	0.60	.....	.....	a 253.78
Lower bridge, Dolgeville, to High falls.....	3.64	.....	.....	a 257.42
High falls to junction with Gillett creek.....	0.84	.....	.....	a 258.26
<i>Gillett Creek</i>				
Source to junction with East Canada creek.....	10.92	.....	.....	a 269.18
<i>EAST CANADA CREEK</i>				
Junction with Gillett creek to Ingham Mills.....	8.73	.....	.....	a 277.91
Ingham Mills to Beardslee Falls.....	3.60	.....	.....	a 281.51
Beardslee Falls to mouth.....	0.30	.....	.....	a 281.81

a Corrected for error of 0.2 noted in Report of State Engineer and Surveyor for 1916, Vol. II, pages 322 and 325.

Drainage areas of SCHOHARIE CREEK*

(From U. S. G. S. topographic maps)

LIMITS	AREA IN SQUARE MILES	
	Place to place	Total
Source to Pratt Rocks, about 1½ miles above Prattville highway bridge.....	225.89	225.89
Pratt Rocks to Prattville gage at highway bridge, Prattville.....	10.23	236.12
Prattville gage to Devasego Falls, at falls.....	6.84	242.96
Devasego Falls to Gilboa, at power dam.....	70.75	313.71
Gilboa to North Blenheim, at old dam.....	88.85	402.56
North Blenheim to Middleburg, at highway bridge.....	129.01	531.57
Middleburg to Schoharie Junction, at D. & H. R. R. bridge.....	284.13	815.70
Schoharie Junction to Sloansville, at highway bridge.....	16.35	832.05
Sloansville to Esperance, at highway bridge.....	43.77	875.82
Esperance to Burtonville, at power dam, about ¼ mile above highway bridge.....	10.87	886.69
Burtonville to Florida, just below fordway.....	19.43	906.12
Florida to Wellsville, about ½ mile above highway bridge.....	7.95	914.07
Wellsville to Mill Point, about ¼ mile below highway bridge.....	6.36	920.43
Mill Point to Fort Hunter, at Fort Hunter feeder dam.....	9.45	929.88

* This table is the result of a joint determination of drainage areas of Schoharie creek, based on independent computations by the engineers of the Board of Water Supply of the city of New York and of the Department of State Engineer.

DELTA RESERVOIR

Gage No. 155

Location.—Above the dam of the Delta reservoir.

Records available.—May 1, 1913, to June 30, 1921.

Gage.—Staff on the substructure of the gate-house.

Accuracy.—Gage read twice daily to tenths.

Coöperation.—Station established by this Department. Gage read by employees of the Department of Public Works.

Daily elevation of water-surface, (B. C. datum) of DELTA RESERVOIR ABOVE DELTA DAM, for the year ended June 30, 1921

D. r	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	543.20	541.30	538.00	535.85	534.45	544.45	550.0	549.4	547.5	548.45	547.3	545.4
2.....	543.00	541.30	537.90	536.15	534.7	545.7	550.3	549.3	547.65	548.5	547.2	545.3
3.....	542.85	541.25	537.75	536.15	536.0	546.35	550.8	549.2	548.05	548.45	547.05	545.2
4.....	542.75	541.15	537.55	536.1	536.35	546.55	550.7	549.05	548.45	548.35	546.9	545.2
5.....	542.60	541.00	537.40	536.15	536.45	547.15	550.6	548.9	548.6	548.2	546.7	545.2
6.....	542.50	540.90	537.30	536.15	536.55	548.4	550.55	548.8	548.8	548.0	546.55	545.1
7.....	542.40	540.80	537.15	536.05	536.6	548.7	550.45	548.7	550.2	547.85	546.4	545.0
8.....	542.40	540.65	536.95	535.95	536.6	548.8	550.3	548.6	551.4	547.65	546.3	545.0
9.....	542.40	540.50	536.80	535.85	536.7	548.8	550.2	548.6	552.05	547.45	546.3	544.9
10.....	542.30	540.40	536.70	535.75	536.95	548.75	550.1	548.4	551.6	547.4	546.2	544.8
11.....	542.20	540.25	536.75	535.7	537.15	548.7	550.0	548.3	550.95	547.4	545.95	544.8
12.....	542.15	540.10	536.70	535.6	537.25	548.7	550.0	548.2	550.7	547.35	545.75	544.9
13.....	542.05	540.05	536.85	535.5	537.4	548.6	549.9	548.2	550.4	547.25	545.55	544.9
14.....	541.95	540.30	536.90	535.4	537.5	549.35	549.8	548.1	550.0	547.15	545.4	544.8
15.....	541.90	540.20	536.80	535.3	537.5	551.15	549.8	548.0	549.15	547.1	545.3	544.8
16.....	541.85	540.15	536.70	535.2	537.4	550.85	549.9	547.9	548.75	547.1	545.3	544.7
17.....	541.70	540.05	536.70	535.15	537.95	550.7	549.85	548.1	548.05	547.35	545.2	544.7
18.....	541.60	539.90	536.55	535.1	538.8	550.6	549.8	548.3	547.15	547.6	545.1	544.7
19.....	542.05	539.75	536.45	535.05	539.15	550.5	549.7	548.4	546.35	547.7	545.1	544.6
20.....	542.30	539.60	536.25	535.0	539.35	550.4	549.65	548.4	546.75	547.7	545.0	544.6
21.....	542.30	539.45	536.10	534.9	539.55	550.25	549.6	548.4	547.15	547.6	545.0	544.5
22.....	542.25	539.30	535.95	534.8	539.85	550.15	549.6	548.3	547.3	547.6	545.0	544.4
23.....	542.15	539.15	535.80	534.7	541.8	550.4	549.75	548.3	547.25	547.6	545.0	544.3
24.....	542.05	539.00	535.70	534.6	543.45	550.6	549.85	548.15	547.2	547.8	545.0	544.2
25.....	541.95	538.90	535.55	534.5	543.85	550.45	549.9	547.85	547.4	547.8	545.1	544.15
26.....	541.85	538.75	535.40	534.45	544.1	550.25	549.8	547.65	547.7	547.8	545.1	544.1
27.....	541.70	538.55	535.30	534.4	544.2	550.15	549.75	547.45	547.8	547.6	545.1	544.05
28.....	541.60	538.45	535.30	534.5	544.3	550.1	549.65	547.35	547.9	547.5	545.1	544.0
29.....	541.45	538.30	535.30	534.5	544.35	550.0	549.6	.....	548.0	547.5	545.15	544.0
30.....	541.35	538.20	535.45	534.45	544.4	550.0	549.5	.....	548.0	547.35	545.3	544.0
31.....	541.20	538.10	.....	534.4	.....	550.1	549.4	.....	547.9	.....	545.35	.....

MOHAWK RIVER AT SPRING BROOK HATCHERY

Gage No. 409

Location.—About $1\frac{1}{4}$ miles below the Delta dam and $4\frac{3}{4}$ miles north of the city of Rome.

Records available.—Water surface elevations, December 1, 1919, to June 30, 1921.

Gage.—Staff on a four-branched elm tree on the west bank of the river, about 600 feet northeast of the farm bridge over Black River canal at Spring Brook hatchery. Read by Mr. John Hoferd.

Discharge.—Current meter measurements made from cable and wading. Discharge records not available due to incomplete rating table.

Accuracy.—Gage read once daily to half-tenths.

Coöperation.—Station established and maintained by this Department.

Daily elevation of water-surface (B. C. datum) OF MOHAWK RIVER AT SPRING BROOK HATCHERY NEAR DELTA, for the year ended June 30, 1921

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.	475.95	475.95	475.90	475.8	475.85	476.0	475.95	475.9	476.5	476.5	475.95	475.6
2.	475.95	475.95	475.95	475.8	475.85	476.5	476.7	475.9	476.5	476.5	475.95	475.6
3.	475.95	475.95	475.95	475.8	475.87	476.5	477.4	475.85	476.55	476.5	475.95	475.6
4.	475.95	475.95	475.95	475.8	475.85	476.0	477.15	475.85	476.5	476.5	475.9	475.65
5.	475.95	475.95	475.95	475.8	475.85	476.15	476.85	475.85	476.45	476.5	475.9	475.65
6.	475.90	475.95	475.95	475.8	475.85	476.0	476.8	475.9	476.6	476.5	475.85	475.65
7.	475.90	475.95	475.95	475.8	475.83	475.95	476.45	475.9	477.4	476.5	475.8	475.65
8.	475.95	475.95	475.90	475.8	475.8	475.95	476.3	475.9	480.9	476.2	475.8	475.65
9.	475.95	475.95	475.90	475.8	475.8	475.95	476.2	475.85	481.7	475.95	475.8	475.65
10.	475.95	475.95	475.85	475.8	475.8	475.9	476.0	475.85	481.4	475.95	475.8	475.65
11.	475.95	475.90	475.85	475.8	475.78	475.9	475.95	475.9	478.6	475.9	475.8	475.65
12.	475.95	475.90	475.85	475.8	475.75	475.9	475.9	475.9	479.4	475.9	475.8	475.65
13.	475.95	475.95	475.85	475.8	475.7	475.9	475.9	475.9	478.9	475.9	475.75	475.65
14.	475.95	475.95	475.85	475.8	475.65	476.05	475.9	475.9	479.5	475.9	475.75	475.65
15.	475.90	475.95	475.85	475.8	475.85	476.55	475.9	475.95	479.3	475.9	475.75	475.65
16.	475.90	475.95	475.85	475.8	475.87	477.65	475.5	476.0	479.35	475.9	475.75	475.65
17.	475.95	475.95	475.85	475.8	476.25	477.05	475.2	475.95	479.3	475.95	475.7	475.65
18.	475.95	475.90	475.80	475.8	475.95	476.8	474.9	475.95	479.0	476.0	475.65	475.65
19.	476.0	475.90	475.80	475.8	475.95	476.5	475.2	475.9	478.5	475.95	475.65	475.65
20.	476.0	475.95	475.80	475.78	475.9	476.35	475.8	475.9	476.6	475.95	475.6	475.65
21.	475.95	475.90	475.80	475.78	475.9	476.2	475.9	475.9	476.55	476.0	475.6	475.65
22.	475.95	475.90	475.80	475.78	476.0	476.1	475.9	475.9	476.4	476.0	475.6	475.65
23.	475.95	475.90	475.80	475.78	476.55	476.4	475.9	475.9	476.5	475.95	475.6	475.65
24.	475.95	475.90	475.80	475.78	476.0	477.0	475.9	476.0	476.5	475.95	475.6	475.65
25.	475.95	475.90	475.80	475.78	475.95	476.65	475.9	476.4	476.5	475.95	475.6	475.65
26.	475.95	475.90	475.80	475.78	475.9	476.25	475.9	476.4	476.5	475.95	475.6	475.65
27.	475.95	475.90	475.80	475.78	475.9	476.15	475.9	476.4	476.5	475.95	475.6	475.65
28.	475.95	475.90	475.80	475.78	476.0	476.05	475.9	476.4	476.5	475.95	475.6	475.65
29.	475.95	475.90	475.80	475.8	476.0	476.0	475.9	.....	476.5	475.95	475.6	475.65
30.	475.95	475.90	475.80	475.8	475.95	475.95	475.9	.....	476.5	475.95	475.6	475.65
31.	475.95	475.90	.....	475.8	.....	475.95	475.9	.....	476.5	.....	475.6	.....

MOHAWK RIVER AT REXFORD

Gage No. 138

Location.—At the Rexford aqueduct about 3.7 miles below Schenectady.

Records available.—Discharge, December 8, 1898, to December 30, 1901. Water surface elevations, August 24, 1905, to June 30, 1921.

Gage.—Staff on the upstream side of the south abutment of the old Erie canal aqueduct. Read by Mr. John Reepmeyer, Jr.

Discharge.—No discharge obtained.

Accuracy.—Gage read twice daily to tenths.

Coöperation.—Station established by the United States Deep Waterways Commission, now maintained by this Department.

Daily elevation of water-surface of MOHAWK RIVER AT REXFORD, for the year ending June 30, 1921

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	211.5	211.3	211.3	215.3	211.6	214.15	212.0	211.0	212.5	212.75	213.1	211.5
2.....	211.4	211.3	211.3	212.7	211.6	212.9	212.6	211.0	212.6	212.65	212.25	211.5
3.....	211.3	211.3	211.3	212.25	212.2	212.1	213.15	211.0	213.8	212.55	212.3	211.5
4.....	211.35	211.3	211.3	212.0	212.1	212.6	213.6	211.0	219.05	212.4	212.1	211.5
5.....	211.4	211.3	211.2	211.9	212.0	213.2	215.35	211.0	214.55	212.2	211.95	211.5
6.....	211.75	211.3	211.2	211.75	212.0	214.8	213.65	211.0	213.3	212.1	211.85	211.5
7.....	211.5	211.3	211.2	211.65	211.9	212.3	212.8	211.0	218.5	212.0	211.8	211.5
8.....	211.4	211.3	211.2	211.6	211.9	211.45	212.6	211.0	219.0	212.0	211.8	211.3
9.....	211.35	211.3	211.2	211.5	211.8	211.95	211.9	211.0	216.4	211.9	211.6	211.3
10.....	211.3	211.3	211.2	211.3	211.8	211.7	211.8	211.0	214.7	212.0	211.6	211.3
11.....	211.3	211.85	211.2	211.2	211.8	211.6	211.5	211.0	213.1	211.9	211.4	211.3
12.....	211.3	211.65	211.35	211.2	211.8	211.6	211.2	211.0	212.6	211.9	211.5	211.3
13.....	211.4	211.55	213.45	211.2	211.8	210.3	211.2	211.0	212.5	211.8	211.5	211.2
14.....	211.5	211.9	212.7	211.2	211.8	210.3	211.2	211.0	212.45	211.6	211.5	211.2
15.....	211.6	211.8	212.4	211.2	211.8	215.3	211.2	211.0	212.2	211.6	211.6	211.2
16.....	211.7	211.7	212.1	211.2	211.8	213.15	211.0	211.8	212.5	211.4	211.5	211.2
17.....	211.6	211.7	211.85	211.3	211.5	212.1	211.0	213.0	212.75	211.6	211.5	211.2
18.....	211.5	211.65	211.7	211.3	211.5	211.75	211.0	213.15	212.25	211.2	211.6	211.2
19.....	211.4	211.9	211.6	211.3	210.6	211.6	211.0	212.85	212.2	212.4	211.5	211.2
20.....	211.4	211.7	211.55	211.3	210.6	210.5	211.0	212.55	212.35	211.9	211.5	211.2
21.....	211.3	211.6	211.4	211.3	211.0	212.15	211.0	212.6	212.7	211.6	211.5	211.2
22.....	211.3	211.5	211.3	211.3	211.2	212.2	211.0	212.5	212.6	211.9	211.5	211.2
23.....	211.3	211.4	211.3	211.3	212.75	212.0	211.0	212.3	212.4	212.0	211.5	211.2
24.....	211.3	211.4	211.3	211.4	212.85	212.2	211.0	212.3	212.4	212.6	211.5	211.2
25.....	211.3	211.3	211.3	211.4	211.95	212.0	211.0	212.35	212.5	212.3	211.5	211.2
26.....	211.3	211.3	211.3	211.4	211.4	212.0	211.0	212.4	212.8	212.1	211.5	211.2
27.....	211.3	211.3	211.3	211.6	211.5	212.0	211.0	212.4	213.05	211.95	211.5	211.2
28.....	211.3	211.3	211.7	211.6	211.9	212.0	211.0	212.4	212.75	211.8	211.5	211.2
29.....	211.3	211.3	211.6	211.6	211.8	212.0	211.0	.....	212.6	211.9	211.5	211.2
30.....	211.3	211.3	211.7	211.6	212.2	212.0	211.0	.....	212.4	212.5	211.5	211.2
31.....	211.3	211.3	.....	211.6	.....	a	211.0	.....	212.4	.....	211.5	.....

a No record.

MOHAWK RIVER AT VISCHER FERRY

Gage No. 137

Location.—Above the Vischer Ferry dam about 8 miles below Schenectady.

Records available.—Discharge, June 24, 1913, to September 30, 1919. Water-surface elevation, June 24, 1913, to June 30, 1921.

Gage.—Staff on the upper end of Lock No. 7.

Discharge.—No discharge obtained.

Accuracy.—Gage read four times daily to tenths.

Coöperation.—Station established by the United States Geological Survey. Gage read by employees of the Department of Public Works.

Daily elevation of water-surface (B. C. datum) of MOHAWK RIVER ABOVE VISCHER FERRY DAM No. 3, for the year ended June 30, 1921

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.	211.58	211.62	211.60	213.98	211.7	211.52	212.0	211.7	212.13	212.63	213.1	211.6
2.	211.60	211.58	211.50	212.38	211.7	213.1	211.9	211.7	212.4	212.7	212.5	211.6
3.	211.57	211.60	211.55	211.82	212.0	212.52	212.42	211.7	212.73	212.47	212.5	211.6
4.	211.58	211.62	211.55	212.02	212.22	211.78	212.58	211.7	213.47	212.4	212.28	211.6
5.	211.50	211.55	211.50	212.05	211.92	211.38	212.42	211.7	211.98	212.3	212.2	211.6
6.	211.52	211.50	211.60	211.92	211.72	213.65	212.35	211.93	209.67	212.2	212.03	211.6
7.	211.50	211.60	211.55	211.88	211.8	212.12	212.35	212.0	212.87	212.2	212.0	211.6
8.	211.52	211.58	211.52	211.82	211.8	211.18	212.1	211.93	212.8	211.9	211.95	211.6
9.	211.50	211.50	211.52	211.82	211.78	211.60	a	211.8	213.2	212.13	211.88	211.6
10.	211.50	211.50	211.60	211.68	211.9	212.0	211.98	211.8	213.7	212.1	211.8	211.6
11.	211.50	211.72	211.60	211.72	211.45	211.9	211.92	211.8	212.7	211.97	211.8	211.6
12.	211.50	212.00	211.80	211.75	211.12	211.92	211.92	211.7	212.3	212.0	211.8	211.6
13.	211.50	211.58	212.95	211.7	211.65	211.48	211.72	211.7	212.13	211.97	211.8	211.6
14.	211.52	211.98	212.32	211.7	211.7	207.62	211.7	211.7	212.27	211.77	211.8	211.6
15.	211.50	212.15	211.92	211.68	211.7	213.62	211.78	211.7	212.0	211.7	211.8	211.6
16.	211.65	211.85	211.72	211.7	211.72	212.72	212.1	211.73	212.0	211.7	211.8	211.6
17.	211.60	211.90	211.75	211.55	211.75	212.5	211.92	211.83	212.47	211.6	211.8	211.6
18.	211.60	211.58	211.80	211.62	211.9	211.6	211.6	212.97	212.2	212.37	211.7	211.6
19.	211.60	211.75	211.68	211.65	211.48	210.65	211.55	212.47	211.93	212.43	211.7	211.6
20.	211.98	211.75	211.60	211.68	210.92	210.2	211.72	212.03	211.87	212.37	211.7	211.6
21.	211.78	211.75	211.60	211.6	210.48	212.1	211.7	211.83	212.43	212.13	211.65	211.55
22.	211.50	211.70	211.52	211.6	211.7	212.2	211.82	211.8	212.37	212.1	211.6	211.5
23.	211.55	211.52	211.52	211.58	211.77	212.13	212.2	211.8	212.2	212.1	211.6	211.5
24.	211.65	211.58	211.52	211.6	212.4	212.25	212.2	211.8	212.33	212.33	211.6	211.5
25.	211.70	211.62	211.58	211.6	211.67	212.3	211.95	211.7	212.47	212.5	211.6	211.5
26.	211.60	211.60	211.50	211.6	211.15	212.2	211.8	211.7	212.7	212.3	211.65	211.5
27.	211.55	211.60	211.50	211.6	208.47	209.95	211.7	211.7	212.93	212.07	211.7	211.5
28.	211.58	211.60	211.72	211.75	211.73	211.22	211.7	211.77	212.73	211.8	211.7	211.55
29.	211.58	211.60	211.85	211.8	211.75	211.9	211.7	.....	212.67	211.93	211.7	211.6
30.	211.58	211.60	212.05	211.8	211.8	211.92	211.7	.....	212.6	212.73	211.65	211.6
31.	211.58	211.52	.....	211.78	.....	211.95	211.7	.....	212.4	.....	211.6	.....

a No record.

MOHAWK RIVER AT VISCHER FERRY

Gage No. 136

Location.—Below Vischer Ferry dam about 8 miles below the city of Schenectady.

Records available.—May 1, 1916, to June 30, 1921.

Gage.—Staff on lower end of Lock No. 7.

Discharge.—No discharge obtained.

Accuracy.—Gage read four times daily to tenths.

Coöperation.—Station established by this Department. Gage read by employees of the Department of Public Works.

Daily elevation of water-surface (B. C. datum) of MOHAWK RIVER BELOW VISCHER FERRY DAM No. 3, for the year ended June 30, 1921

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1	184.72	184.68	184.70	188.12	184.8	185.2	185.0	184.7	185.2	185.87	187.0	184.6
2	184.70	184.60	184.52	187.25	184.8	187.25	185.0	184.8	185.7	185.93	186.95	184.6
3	184.60	184.60	184.58	185.72	184.92	187.62	185.6	184.8	186.1	185.57	185.95	184.6
4	184.62	184.60	184.70	185.05	185.32	186.52	185.9	184.7	187.93	185.5	185.35	184.6
5	184.60	184.60	184.60	185.12	184.92	186.52	185.72	184.7	186.58	185.4	185.38	184.6
6	184.60	184.60	184.60	184.95	184.85	188.88	185.65	185.07	185.6	185.3	185.22	184.6
7	184.60	184.60	184.60	184.92	184.9	187.02	185.65	185.0	187.13	185.3	185.2	184.6
8	184.60	184.60	184.48	184.92	184.9	186.02	185.3	185.0	187.53	184.9	185.08	184.6
9	184.60	184.60	184.50	184.85	184.9	185.45	a	184.8	187.97	184.93	184.95	184.6
10	184.60	184.60	184.62	184.75	185.02	185.32	185.08	184.8	188.53	185.0	184.9	184.6
11	184.60	184.80	184.60	184.68	185.08	185.28	184.92	184.8	187.23	185.07	184.9	184.6
12	184.60	185.15	184.72	184.68	184.98	185.32	184.9	184.7	186.63	185.0	184.9	184.6
13	184.52	184.92	186.05	184.75	184.72	185.48	184.88	184.77	186.47	184.93	184.9	184.6
14	184.60	185.05	185.58	184.7	184.8	185.55	184.7	184.7	186.67	184.67	184.88	184.6
15	184.60	185.20	185.08	184.7	184.8	188.75	184.78	184.7	186.27	184.6	184.9	184.6
16	184.65	185.00	184.90	184.7	184.8	187.75	185.3	184.7	186.1	184.67	184.9	184.6
17	184.68	184.95	184.80	184.62	184.8	186.67	185.05	184.93	186.9	184.7	184.9	184.6
18	184.70	184.95	184.75	184.7	185.45	186.45	184.68	186.33	186.43	185.63	184.8	184.6
19	184.70	184.80	184.70	184.7	185.65	186.05	184.5	185.83	186.07	185.73	184.8	184.6
20	184.98	184.80	184.68	184.7	185.25	184.85	184.68	185.33	186.0	185.57	184.8	184.6
21	184.95	184.80	184.62	184.68	185.25	185.1	184.6	185.03	186.77	185.27	184.75	184.6
22	184.60	184.80	184.60	184.7	185.05	185.3	184.75	184.9	186.73	185.1	184.63	184.6
23	184.60	184.52	184.60	184.7	185.07	185.23	185.4	184.9	186.4	185.27	184.65	184.6
24	184.68	184.58	184.60	184.7	186.45	185.2	185.22	184.9	186.0	185.53	184.7	184.58
25	184.70	184.70	184.65	184.7	185.8	185.3	185.0	184.8	185.73	185.73	184.7	184.6
26	184.68	184.67	184.65	184.7	185.8	185.3	184.9	184.8	186.0	185.33	184.75	184.6
27	184.60	184.65	184.50	184.7	185.23	185.08	184.7	184.7	186.6	185.17	184.7	184.6
28	184.68	184.62	184.70	184.72	185.17	184.68	184.7	184.87	186.4	184.9	184.7	184.6
29	184.67	184.70	184.82	184.8	185.18	184.85	184.7	.....	186.4	185.0	184.7	184.6
30	184.60	184.70	185.00	184.8	185.1	184.95	184.73	.....	186.2	185.93	184.7	184.6
31	184.60	184.70	.....	184.8	.....	184.85	184.8	.....	185.8	.....	184.65	.....

a No record.

MOHAWK RIVER AT CRESCENT

Gage No. 134

Location.—Above the Crescent dam about $2\frac{1}{2}$ miles above the city of Cohoes.

Records available.—October 22, 1916, to June 30, 1921.

Gage.—Staff on north side of pier between guard-gate and by-pass.

Discharge.—See Mohawk river at Crescent, page 190.

Accuracy.—Gage read twice daily to tenths.

Coöperation.—Station established by this Department. Gage read by employees of the Department of Public Works.

Daily elevation of water-surface (B. C. datum) of MOHAWK RIVER ABOVE CRESCENT DAM, NEAR COHOES, for the year ended June 30, 1921

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	184.6	184.5	184.55	188.1	184.6	185.35	184.7	184.7	185.15	185.85	186.5	184.65
2.....	184.55	184.55	184.5	187.3	184.6	187.35	185.05	184.8	185.6	185.95	186.3	184.55
3.....	184.6	184.6	184.55	185.6	185.05	186.95	185.6	184.8	186.05	185.8	185.85	184.5
4.....	184.55	184.6	184.6	185.0	185.3	186.25	185.75	184.75	187.05	185.5	185.25	184.5
5.....	184.5	184.6	184.5	185.1	185.1	186.35	185.65	184.7	186.05	185.45	185.25	184.5
6.....	184.5	184.5	184.5	185.0	185.0	188.1	185.55	184.85	185.55	185.25	185.1	184.5
7.....	184.5	184.5	184.5	184.8	184.85	186.55	185.45	185.0	186.55	185.25	185.15	184.5
8.....	184.6	184.5	184.5	184.85	184.75	185.9	185.3	184.95	187.05	184.95	185.0	184.5
9.....	184.6	184.45	184.5	184.85	184.7	185.35	185.25	184.8	187.35	184.95	184.95	184.5
10.....	184.5	184.45	184.55	184.75	185.0	185.35	185.0	184.85	187.85	184.9	184.85	184.45
11.....	184.5	184.75	184.6	184.7	185.15	185.45	184.85	184.8	186.8	184.85	184.8	184.4
12.....	184.5	185.15	184.5	184.7	184.8	185.35	184.8	184.7	186.45	184.9	184.8	184.45
13.....	184.5	184.95	186.25	184.7	184.7	185.3	184.7	184.75	186.3	184.9	184.8	184.5
14.....	184.5	184.75	185.4	184.7	184.8	185.7	184.55	184.7	186.45	184.65	184.8	184.4
15.....	184.65	185.2	184.95	184.7	184.7	188.1	184.6	184.7	186.15	184.65	184.9	184.4
16.....	184.6	184.9	184.85	184.7	184.75	187.0	185.1	184.6	186.2	184.6	184.8	184.4
17.....	184.8	184.95	184.9	184.6	184.8	186.55	184.65	184.9	186.6	184.65	184.8	184.4
18.....	184.5	184.7	184.8	184.6	185.45	186.1	184.5	186.3	186.25	185.55	184.8	184.35
19.....	184.5	184.75	184.65	184.6	185.5	185.85	184.5	185.75	186.05	185.7	184.8	184.35
20.....	184.9	184.7	184.6	184.6	185.25	185.1	184.5	185.35	186.05	185.45	184.6	184.35
21.....	184.8	184.7	184.6	184.6	185.15	185.2	184.6	185.05	186.55	185.25	184.65	184.35
22.....	184.5	184.6	184.55	184.6	185.0	185.2	184.9	184.85	186.5	185.15	184.65	184.3
23.....	184.6	184.6	184.5	184.6	185.9	185.2	185.2	184.85	186.25	185.2	184.65	184.2
24.....	184.6	184.6	184.55	184.6	187.15	185.3	185.25	184.8	185.95	185.5	184.6	184.25
25.....	184.65	184.6	184.6	184.6	186.15	185.4	185.15	184.8	185.75	185.7	184.6	184.3
26.....	184.55	184.6	184.55	184.6	185.95	185.0	184.95	184.8	185.85	185.3	184.75	184.35
27.....	184.55	184.6	184.5	184.7	185.45	185.0	184.8	184.8	186.3	185.2	184.75	184.35
28.....	184.55	184.55	184.75	184.7	185.25	184.5	184.7	184.8	186.05	184.95	184.5	184.35
29.....	184.5	184.5	184.85	184.7	185.4	184.7	184.75	.....	185.95	185.0	184.6	184.35
30.....	184.55	184.55	184.9	184.7	185.3	184.85	184.8	.....	185.85	185.8	184.55	184.35
31.....	184.5	184.5	.....	184.65	.....	184.95	184.7	.....	185.6	.....	184.5	.....

MOHAWK RIVER AT CRESCENT

Gage No. 133

Location.—Below the Crescent dam about 2½ miles above the city of Cohoes.

Records available.—October 22, 1916, to June 30, 1921.

Gage.—Staff on the southwest corner of the power house.

Accuracy.—Gage read twice daily to tenths.

Discharge.—No discharge obtained.

Coöperation.—Station established by this Department. Gage read by employees of the Department of Public Works.

Daily elevation of water-surface (B. C. datum) of MOHAWK RIVER BELOW CRESCENT DAM, NEAR COHOES, for the year ended June 30, 1921

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	156.25	157.2	156.6	160.9	156.8	158.0	157.4	157.35	157.75	158.55	159.1	156.0
2.....	156.2	156.2	156.85	159.7	157.3	160.1	157.75	157.5	158.4	158.65	159.0	156.1
3.....	157.25	156.0	156.25	158.3	157.7	159.65	158.3	157.4	158.75	158.5	158.55	155.9
4.....	157.3	156.15	156.9	157.7	158.0	158.95	158.6	157.4	159.75	158.2	157.95	156.0
5.....	157.2	155.65	155.75	157.75	157.8	159.15	158.25	157.4	158.3	158.15	157.95	156.2
6.....	155.6	156.75	156.15	157.65	157.7	160.8	158.25	157.55	158.3	157.95	157.8	155.85
7.....	156.1	155.95	155.95	157.45	157.65	159.25	158.15	157.65	159.3	157.95	157.85	155.7
8.....	155.75	155.25	155.25	157.5	157.45	158.6	158.05	157.6	159.8	157.65	157.7	155.7
9.....	155.9	155.7	155.95	157.5	157.3	158.05	157.95	157.5	160.05	157.65	157.65	156.1
10.....	155.6	156.05	155.35	157.45	157.6	158.15	157.7	157.2	160.55	157.6	157.45	155.75
11.....	157.25	157.1	156.3	156.55	157.8	158.15	157.55	157.3	159.5	157.55	157.5	156.5
12.....	155.95	157.6	157.2	156.85	157.45	158.05	157.5	157.2	159.15	157.6	157.5	154.3
13.....	155.75	157.2	159.0	156.8	157.4	158.0	157.4	157.45	159.05	157.6	157.5	155.65
14.....	156.6	157.5	158.1	157.15	157.6	158.15	157.25	156.95	159.2	157.2	157.5	155.15
15.....	156.15	158.05	157.6	157.15	157.3	160.3	157.4	157.4	158.85	157.3	157.65	156.0
16.....	156.9	157.6	157.45	157.3	157.3	159.7	157.9	157.0	158.9	157.3	157.55	155.7
17.....	157.25	157.5	157.5	157.3	157.3	159.25	157.35	157.6	159.3	157.35	157.5	155.65
18.....	157.3	157.5	157.45	156.9	158.15	158.85	157.1	158.9	158.95	158.25	157.2	155.85
19.....	155.95	157.0	157.3	156.6	158.15	158.55	157.2	158.45	158.75	158.4	157.5	156.0
20.....	157.5	157.3	156.7	157.15	157.95	157.8	157.2	157.9	158.75	158.15	156.6	155.6
21.....	157.05	157.3	155.6	156.9	157.95	157.9	157.2	157.8	159.25	157.95	157.2	155.65
22.....	155.85	157.3	155.7	156.6	157.7	157.9	157.4	157.4	159.2	157.85	157.25	155.6
23.....	156.15	156.05	156.5	155.3	158.6	157.9	157.9	157.4	158.95	157.9	157.2	155.1
24.....	156.8	158.15	156.85	157.3	159.85	158.0	157.35	157.35	158.65	158.2	156.05	155.25
25.....	157.4	156.05	156.75	156.15	158.9	158.1	157.5	157.5	158.45	158.4	156.55	156.3
26.....	156.1	156.15	157.25	155.9	158.75	157.7	157.25	157.5	158.55	158.0	157.4	155.5
27.....	156.5	156.15	155.9	156.4	158.2	157.7	157.4	157.5	159.0	157.9	156.25	155.45
28.....	156.5	156.1	157.0	156.8	158.0	156.8	157.6	157.5	158.75	157.65	156.7	155.5
29.....	155.5	156.2	157.3	157.1	158.1	157.35	157.4	.....	158.65	157.7	155.8	155.75
30.....	156.7	156.15	157.3	157.3	157.95	157.5	157.4	.....	158.55	158.5	155.25	154.95
31.....	155.7	156.0	.....	157.55	.....	157.65	157.35	.....	158.3	.....	156.15	.....

MOHAWK RIVER AT CRESCENT DAM

Location.—At the Crescent dam of the Barge canal, about 3 miles above the mouth of the river at Cohoes, Albany county.

Drainage area.—3,490 square miles (measured on topographic maps by the State Engineer Department).

Records available.—December 1, 1917, to June 30, 1921.

Gage.—Gurley 7-day graph water-stage recorder on left bank about 50 feet above guard gate at head of Waterford flight of locks and about 200 yards from left end of spillway. Inspected by operator from Barge Canal power house at the dam.

Discharge measurements.—Made from steel highway bridge at Crescent, about $1\frac{1}{2}$ miles upstream.

Channel and control.—The control is the crest of the spillway.

Extremes of discharge.—Maximum stage during year from water-stage recorder, 8.31 feet at 8 A. M. December 6 (discharge, 50,300 second-feet); minimum discharge, 1,050 second-feet June 24.

1917–1921: Maximum stage recorded, 9.24 feet at 4 P. M. March 27, 1920 (discharge, 67,200 second-feet). Minimum stage recorded, 4.04 feet at 6 A. M. August 21, 1918 (discharge, 157 second-feet).

Diversions.—Water is diverted at this point for canal purposes through Lock 6 and through the power plant located at this lock. The following tables of discharge include the flow through Lock 6 and through the power plant.

Regulation.—Seasonal distribution of flow regulated by the Delta reservoir on the upper Mohawk, and by Hinckley reservoir on West Canada creek. Large diurnal fluctuations occur during low water caused by operation of movable dams upstream.

Accuracy.—Stage-discharge relation permanent; probably not affected by ice. Rating curve well defined between 5,000 and 50,000 second-feet. Record from water-stage recorder satisfactory. Results good.

Coöperation.—Station established and maintained by the United States Geological Survey in coöperation with the State Engineer and Surveyor. Recorder inspected by an employee of the State Superintendent of Public Works. Record of gate openings June 9–30 furnished by Cohoes Power and Light Corporation.

Discharge measurements of MOHAWK RIVER AT CRESCENT DAM, during the year ending June 30, 1921

DATE	Made by	Gage height	Discharge
		<i>Feet</i>	<i>Sec.-ft.</i>
Nov. 26.	Covert and Currier.	5.75	12,100
Nov. 29.	Currier and Lauterhahn.	5.23	6,350
Dec. 2.	S. M. Currier.	7.43	34,600
Dec. 6.	S. M. Currier.	8.22	47,900
Dec. 15.	S. M. Currier.	8.02	46,800
Dec. 17.	B. F. Howe.	6.25	18,400
Apr. 5.	S. M. Currier.	5.37	5,960
Apr. 14.	B. F. Howe.	4.74	7,785
Apr. 20.	Shupe and Lauterhahn.	5.49	8,970

Daily discharge, in second-feet, of MOHAWK RIVER AT CRESCENT DAM, for the year ending June 30, 1921

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.	1,820	1,630	1,910	39,800	2,770	7,070	4,000	2,410	5,250	13,500	23,100	2,270
2.	2,060	1,580	1,580	27,100	2,820	31,700	4,200	2,410	8,920	14,400	19,300	1,950
3.	2,000	1,690	1,520	9,700	5,520	28,000	9,270	2,300	14,600	11,100	11,300	1,820
4.	1,960	1,900	1,490	5,480	7,600	16,200	11,100	2,250	27,500	8,710	7,230	1,800
5.	1,860	1,260	1,350	5,590	4,980	21,500	8,920	2,350	15,100	7,930	5,740	1,700
6.	2,120	1,260	1,330	4,230	3,470	44,100	8,620	3,350	8,820	7,220	4,870	1,680
7.	1,480	1,480	1,300	3,640	3,650	21,500	7,520	3,870	21,600	6,300	5,050	1,580
8.	1,870	1,700	1,320	3,630	3,320	12,300	5,430	3,740	27,500	4,120	4,160	1,510
9.	1,620	1,520	1,170	3,200	3,260	7,250	5,050	3,040	32,000	4,350	3,560	1,620
10.	1,670	1,450	1,580	3,100	5,130	6,530	4,200	2,630	38,400	4,570	3,180	1,380
11.	1,440	3,080	1,580	2,730	5,780	6,280	3,410	2,570	25,300	4,450	3,070	1,500
12.	1,510	5,320	2,980	2,670	3,750	5,870	3,480	2,630	19,600	4,490	3,060	1,440
13.	1,880	3,890	15,700	2,670	2,800	8,490	2,630	2,520	18,200	3,930	3,120	1,440
14.	2,230	3,760	7,440	2,620	3,050	8,940	2,090	2,300	19,600	2,560	3,410	1,320
15.	2,240	5,460	3,880	2,510	3,110	41,600	2,920	2,300	15,500	2,400	3,550	1,330
16.	3,030	3,750	2,650	2,480	3,100	28,800	4,620	2,520	18,200	2,240	3,300	1,290
17.	2,160	3,640	3,200	1,770	4,330	20,300	4,130	4,210	21,700	2,810	3,010	1,380
18.	1,770	3,490	2,600	2,230	9,070	16,200	1,810	15,500	17,500	9,660	2,700	1,190
19.	1,650	2,490	1,950	2,500	9,380	12,300	1,420	9,780	14,900	10,300	2,640	1,090
20.	3,360	2,200	1,800	2,510	6,650	5,690	2,090	5,990	15,700	8,520	2,500	1,390
21.	3,390	2,290	1,460	2,030	5,450	5,450	2,300	3,610	22,400	6,570	2,510	1,200
22.	1,820	2,340	1,100	2,190	4,380	5,300	3,380	2,920	21,700	6,140	2,470	1,160
23.	1,640	1,580	1,570	1,830	17,300	4,780	6,140	2,800	19,600	6,580	2,050	1,080
24.	1,670	1,820	1,620	2,140	28,300	6,240	5,900	2,920	13,500	9,050	2,000	1,050
25.	2,660	1,950	2,000	1,750	16,200	6,080	3,990	2,690	11,600	11,200	2,210	1,170
26.	1,980	1,860	1,240	1,910	12,500	4,220	2,520	2,570	13,900	7,620	2,810	1,180
27.	1,850	1,720	1,250	2,290	7,240	3,140	1,840	2,350	18,200	5,970	2,850	1,270
28.	1,940	1,640	2,350	2,200	5,470	1,920	2,250	2,690	15,500	4,350	1,980	1,260
29.	1,680	1,510	2,870	3,430	6,350	3,240	2,410	.....	14,700	4,720	1,950	1,260
30.	1,920	1,360	4,520	3,080	6,460	3,690	2,690	.....	12,900	11,800	1,880	1,380
31.	1,380	1,230	.....	2,780	.....	3,890	2,410	.....	10,600	.....	1,800	.....

NOTE.— Above figures of daily discharge include flow over spillway, through lock and power house and through sluice gates and mud gates as manipulated. No gage-height record July 15-17; discharge estimated from record at Vischer Ferry dam.

Monthly discharge of MOHAWK RIVER AT CRESCENT DAM, for the year ending June 30, 1921

(Drainage area, 3,490 square miles)

MONTH	DISCHARGE IN SECOND-FEET				RUN-OFF
	Maximum	Minimum	Mean	Per square mile	Depth in inches on drainage area
July.....	3,390	1,380	1,990	.570	.66
August.....	5,460	1,230	2,320	.665	.77
September.....	4,520	1,100	2,610	.748	.83
October.....	39,800	1,750	5,020	1.44	1.66
November.....	28,300	2,770	6,770	1.94	2.16
December.....	44,100	1,920	12,900	3.70	4.27
January.....	11,100	1,420	4,280	1.23	1.42
February.....	15,500	2,250	3,620	1.04	1.08
March.....	38,400	5,250	18,100	5.19	5.98
April.....	14,400	2,240	6,920	1.98	2.21
May.....	23,100	1,800	4,590	1.32	1.52
June.....	2,270	1,050	1,420	.407	.45
The year.....	44,100	1,050	5,910	1.69	23.01

MOHAWK RIVER NEAR COHOES

Gage No. 132

Location.—Above the dam of the Cohoes Power Company about one mile above the city of Cohoes.

Records available.—April 1, 1904, to June 30, 1921.

Gage.—Staff in two sections on downstream side of the break-water and near the right bank. Read by Mr. A. Plouffe.

Discharge.—No discharge obtained.

Accuracy.—Gage read twice daily to tenths. Owing to the irregular use of water for power purposes the surface above the dam fluctuates as much as 7 or 8 feet during twenty-four hours.

Coöperation.—Station established in coöperation with the weather bureau but now maintained by this Department.

Daily elevation of water-surface (B. C. datum) of MOHAWK RIVER ABOVE DAM AT
CONOMS, for the year ended June 30, 1921

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	156.05	157.2	156.85	160.05	156.85	157.75	157.8	156.95	157.7	158.45	159.3	156.5
2.....	156.15	156.0	156.4	159.5	156.95	159.8	157.8	156.75	158.05	158.7	158.95	156.0
3.....	157.05	156.2	156.3	158.5	157.65	159.55	158.15	156.75	158.4	158.55	158.4	155.9
4.....	157.5	156.35	156.9	157.8	158.1	159.0	158.4	156.75	159.55	158.1	158.0	156.0
5.....	156.8	155.7	155.5	157.0	157.65	159.1	158.15	157.4	158.75	157.95	157.75	156.45
6.....	155.75	156.4	156.25	157.5	157.55	160.45	158.15	157.7	158.35	157.85	157.75	155.9
7.....	156.1	156.0	155.5	157.3	157.8	159.3	158.05	157.5	158.8	157.85	157.9	155.9
8.....	155.85	155.45	155.25	157.3	157.4	158.5	157.85	157.6	159.35	157.5	157.8	156.05
9.....	155.95	155.65	155.3	157.3	157.25	158.05	158.0	157.3	159.6	157.75	157.35	156.1
10.....	155.6	155.6	155.4	157.5	157.55	158.05	157.65	157.1	160.05	157.8	157.25	155.85
11.....	157.05	157.1	156.05	156.55	157.7	158.3	157.45	157.15	159.35	157.55	157.2	156.15
12.....	155.9	157.65	157.4	156.65	157.5	158.25	157.6	157.3	159.1	157.5	157.15	154.25
13.....	155.95	157.7	158.7	156.85	157.3	158.15	157.4	157.5	159.0	157.5	157.2	155.9
14.....	156.35	157.65	157.95	156.85	157.7	158.1	157.25	156.75	159.0	156.75	157.55	155.5
15.....	156.3	158.15	157.4	157.0	157.2	160.35	157.5	156.75	158.7	156.5	157.25	156.3
16.....	156.75	157.55	156.9	157.15	157.15	159.6	157.85	156.95	158.7	157.3	157.2	156.05
17.....	156.25	157.3	157.3	157.35	157.25	159.2	157.6	157.25	159.15	157.35	157.2	155.9
18.....	157.3	157.25	157.3	156.45	158.0	158.9	156.85	158.75	158.85	158.15	158.55	155.95
19.....	156.05	157.0	157.25	156.5	158.15	158.75	156.0	158.35	158.85	158.1	157.0	156.15
20.....	157.0	156.8	156.65	157.05	157.8	157.75	156.85	158.05	158.75	158.05	156.45	156.1
21.....	157.25	157.2	155.85	156.7	158.1	157.9	157.0	157.4	159.05	157.75	156.05	155.95
22.....	156.25	157.25	155.5	156.95	157.6	157.9	157.55	157.3	158.95	157.75	157.2	156.05
23.....	156.4	156.15	156.35	155.8	158.4	157.8	158.1	157.25	158.85	157.9	156.05	155.45
24.....	157.05	156.45	156.6	157.5	159.55	158.0	157.85	157.3	158.35	158.25	156.2	155.7
25.....	157.35	155.95	156.7	155.8	158.95	158.15	157.6	157.2	158.25	156.3	156.4	156.15
26.....	156.45	156.35	156.8	155.55	158.6	157.75	156.85	157.45	158.55	157.9	156.6	155.0
27.....	156.45	156.15	155.9	156.1	158.1	157.5	156.65	157.45	159.0	157.65	156.95	155.5
28.....	156.0	156.0	156.65	156.75	158.1	157.1	157.1	157.35	158.7	157.4	155.5	155.55
29.....	155.45	155.3	157.2	157.35	158.0	157.5	157.6	.....	158.5	157.55	156.0	155.7
30.....	156.95	156.3	157.0	157.35	157.8	157.6	157.6	.....	158.4	158.25	155.1	155.4
31.....	155.7	156.25	.....	157.6	.....	157.6	156.95	.....	158.2	.....	156.05	.....

NINE-MILE CREEK NEAR STITTVILLE

Gage No. 159

Location.—At a highway bridge over Nine-Mile creek, known as Powell's bridge, about $1\frac{3}{4}$ miles below the village of Stittville.

Records available.—Discharge, January 1, 1907, to June 30, 1917. Water surface elevations, November 4, 1905, to June 30, 1921.

Gage.—Chain on downstream side of the bridge, read by Mrs. Geo. Powell.

Accuracy.—Gage read twice daily to tenths.

Coöperation.—Station established and maintained by this Department.

Daily elevation of water-surface (B. C. datum) of NINE-MILE CREEK NEAR STITTVILLE,
for the year ended June 30, 1921

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1	484.20	484.30	484.20	485.3	484.2	484.2	484.9	a	484.9	484.45	484.2	484.4
2	484.20	484.20	484.20	484.4	484.2	484.75	486.35	a	485.5	484.4	484.1	484.3
3	484.20	484.20	484.20	484.3	484.65	484.85	484.85	a	486.15	484.1	484.0	484.3
4	484.20	484.20	484.20	484.3	484.2	485.65	484.65	a	485.7	484.0	484.0	484.3
5	484.20	484.20	484.20	484.25	484.2	485.95	484.5	a	485.0	484.0	484.0	484.3
6	484.20	484.20	484.20	484.2	484.2	485.15	484.5	a	485.0	484.0	483.95	484.3
7	484.20	484.20	484.20	484.2	484.2	484.5	484.4	a	485.9	484.0	483.9	484.3
8	484.45	484.20	484.20	484.2	484.2	484.5	484.4	a	486.55	484.0	484.1	484.3
9	484.45	484.20	484.20	484.2	484.2	484.4	484.3	a	486.1	484.0	484.2	484.3
10	484.20	484.20	484.20	484.2	484.6	484.35	484.25	a	485.3	484.0	484.3	484.3
11	484.20	484.50	484.20	484.2	484.4	484.3	484.2	a	484.7	484.0	484.3	484.3
12	484.25	484.40	484.40	484.2	484.2	484.3	484.2	a	484.4	484.0	484.3	484.4
13	484.35	484.50	484.40	484.2	484.15	484.3	484.2	a	485.1	484.0	484.4	484.4
14	484.40	484.40	484.35	484.2	484.1	486.25	484.2	a	484.45	484.0	484.3	484.4
15	484.20	484.40	484.25	484.2	484.1	484.9	484.2	a	484.4	484.0	484.3	484.3
16	484.20	484.30	484.20	484.2	484.1	484.65	484.2	a	486.2	484.0	484.3	484.3
17	484.20	484.30	484.20	484.2	485.85	484.4	484.2	485.65	485.5	484.45	484.3	484.3
18	484.20	484.30	484.20	484.2	484.5	484.4	a	484.3	484.55	484.35	484.3	484.3
19	484.40	484.20	484.20	484.2	484.35	484.3	a	484.2	484.3	484.1	484.3	484.3
20	484.40	484.30	484.25	484.2	484.35	484.4	a	484.2	485.2	484.05	484.3	484.3
21	484.30	484.30	484.20	484.2	484.55	484.5	a	484.2	484.55	484.15	484.3	484.3
22	484.30	484.30	484.20	484.2	484.75	484.7	a	484.2	484.4	484.4	484.3	484.3
23	484.30	484.20	484.20	484.2	487.85	484.45	a	484.2	484.3	484.45	484.3	484.3
24	484.30	484.20	484.20	484.1	484.6	484.4	a	484.2	484.3	484.4	484.3	484.3
25	484.25	484.20	484.20	484.0	484.45	484.4	a	a	484.3	484.15	484.4	484.3
26	484.20	484.20	484.20	484.0	484.4	484.4	a	a	484.2	484.0	484.3	484.3
27	484.20	484.20	484.20	484.0	484.35	484.75	a	a	484.2	484.0	484.3	484.3
28	484.20	484.20	484.20	484.0	484.3	484.5	a	485.75	484.2	484.0	484.3	484.3
29	484.20	484.30	484.20	484.0	484.25	484.6	a	.....	484.2	484.0	484.3	484.5
30	484.20	484.30	484.30	484.0	484.2	484.5	a	.....	484.2	484.4	484.3	484.4
31	484.20	484.25	.....	484.05	.....	484.5	a	.....	484.2	.....	484.35	.....

a No record.

WEST CANADA CREEK DESCRIPTION OF BASIN

West Canada creek rises in West Canada lake, in southwest-central Hamilton county, and flows southwestward, then south-eastward into the Mohawk at Herkimer.

A description of the Hinckley reservoir is given under Mohawk river.

HINCKLEY RESERVOIR

Gage No. 163.

Location.—Above the dam at the Hinckley reservoir.

Records available.—March 27, 1914, to June 30, 1921.

Gage.—Staff on the south face of the north gate-house.

Accuracy.—Gage read once daily to tenths.

Coöperation.—Station established by this Department. Gage read by employees of the Department of Public Works.

Daily elevation of water-surface of HINCKLEY RESERVOIR ABOVE HINCKLEY DAM, for the year ended June 30, 1920

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1	1,221.00	1,225.00	1,224.88	1,223.35	1,226.2	1,225.9	1,220.2	1,199.5	1,175.9	1,212.8	1,226.0	1,223.3
2	1,221.82	1,224.90	1,224.92	1,222.9	1,226.02	1,225.7	1,220.7	1,198.6	1,175.2	1,215.7	1,225.7	1,223.2
3	1,221.75	1,224.80	1,225.12	1,222.85	1,225.9	1,225.55	1,219.3	1,197.95	1,174.95	1,218.8	1,225.4	1,223.1
4	1,221.60	1,224.70	1,225.30	1,222.6	1,225.65	1,225.25	1,218.6	1,197.6	1,174.9	1,222.8	1,225.2	1,222.9
5	1,221.30	1,224.60	1,225.08	1,222.4	1,225.4	1,225.0	1,218.2	1,196.7	1,174.9	1,222.8	1,225.05	1,222.7
6	1,221.25	1,224.45	1,224.90	1,222.85	1,225.5	1,224.8	1,217.55	1,195.9	1,175.2	1,224.0	1,224.9	1,222.5
7	1,221.10	1,224.35	1,224.70	1,222.9	1,225.35	1,224.65	1,216.8	1,195.0	1,175.1	1,224.95	1,224.0	1,222.4
8	1,220.90	1,224.20	1,224.45	1,222.75	1,225.2	1,224.5	1,216.15	1,194.2	1,175.45	1,225.2	1,223.05	1,222.2
9	1,220.70	1,224.10	1,224.40	1,222.5	1,225.03	1,224.4	1,215.7	1,193.35	1,175.6	1,225.05	1,223.15	1,222.1
10	1,220.70	1,224.00	1,224.30	1,222.5	1,224.9	1,224.55	1,215.2	1,192.6	1,175.55	1,224.8	1,223.2	1,221.9
11	1,221.30	1,223.80	1,224.15	1,222.5	1,224.8	1,224.8	1,214.5	1,191.7	1,174.7	1,224.5	1,225.2	1,221.8
12	1,221.80	1,223.70	1,223.65	1,222.5	1,225.0	1,225.1	1,214.0	1,191.1	1,174.6	1,224.0	1,225.1	1,221.7
13	1,222.20	1,223.50	1,223.90	1,222.45	1,225.7	1,225.3	1,213.6	1,190.4	1,176.55	1,223.8	1,225.0	1,221.6
14	1,222.00	1,223.30	1,223.65	1,222.15	1,225.15	1,225.85	1,213.1	1,189.6	1,179.75	1,225.0	1,224.9	1,221.4
15	1,221.90	1,223.10	1,223.45	1,221.82	1,225.85	1,226.05	1,212.6	1,189.0	1,182.3	1,225.5	1,224.6	1,221.3
16	1,222.30	1,222.85	1,223.22	1,224.85	1,225.6	1,225.7	1,212.1	1,188.3	1,185.0	1,225.8	1,224.4	1,221.1
17	1,222.60	1,222.75	1,223.05	1,225.50	1,225.4	1,225.5	1,211.55	1,187.6	1,185.0	1,226.2	1,224.2	1,221.1
18	1,222.80	1,222.70	1,223.25	1,225.70	1,225.2	1,225.2	1,210.85	1,186.8	1,190.15	1,226.1	1,224.0	1,221.0
19	1,222.70	1,222.88	1,222.45	1,225.50	1,225.02	1,225.02	1,210.3	1,186.0	1,191.4	1,226.0	1,223.8	1,221.0
20	1,222.60	1,223.18	1,222.25	1,225.30	1,224.9	1,224.9	1,209.65	1,185.2	1,193.0	1,225.9	1,223.7	1,221.1
21	1,222.55	1,223.30	1,222.10	1,225.15	1,224.65	1,224.8	1,208.8	1,183.8	1,193.7	1,226.3	1,223.6	1,221.2
22	1,222.40	1,223.45	1,222.30	1,225.02	1,224.5	1,224.5	1,208.1	1,182.75	1,194.75	1,226.8	1,223.7	1,221.1
23	1,222.40	1,223.45	1,223.10	1,224.6	1,224.4	1,224.35	1,207.3	1,181.3	1,195.05	1,227.1	1,224.0	1,220.9
24	1,222.30	1,223.60	1,222.85	1,224.5	1,224.5	1,224.05	1,206.4	1,180.3	1,195.66	1,227.2	1,224.2	1,220.8
25	1,222.10	1,223.45	1,223.72	1,225.6	1,224.5	1,223.65	1,205.6	1,179.4	1,195.9	1,226.6	1,224.1	1,220.7
26	1,222.10	1,223.60	1,223.85	1,225.45	1,224.4	1,223.35	1,204.65	1,178.55	1,197.0	1,226.0	1,224.0	1,220.6
27	1,222.00	1,223.68	1,223.90	1,225.68	1,224.6	1,223.05	1,203.75	1,177.8	1,199.5	1,225.6	1,224.0	1,220.4
28	1,222.00	1,223.75	1,223.80	1,225.80	1,225.08	1,222.5	1,202.95	1,177.1	1,202.5	1,225.7	1,223.9	1,220.2
29	1,224.50	1,223.95	1,223.70	1,225.85	1,225.35	1,221.9	1,202.5	1,176.5	1,206.0	1,226.2	1,223.7	1,220.0
30	1,225.00	1,224.05	1,223.60	1,225.6	1,225.65	1,221.45	1,201.4	1,208.4	1,208.4	1,226.3	1,223.5	1,219.9
31	1,225.10	1,224.35	1,223.60	1,225.6	1,225.65	1,220.75	1,200.6	1,210.7	1,210.7	1,226.4	1,223.4	1,219.9

Daily elevation of water-surface of HINCKLEY RESERVOIR AT HINCKLEY DAM, for the year ended June 30, 1921

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1	1,219.8	1,223.1	1,220.4	1,214.2	1,206.7	1,214.3	1,221.9	1,210.7	1,193.8	1,225.1	1,225.7	1,219.2
2	1,219.6	1,223.4	1,220.5	1,215.6	1,206.9	1,216.0	1,221.8	1,210.0	1,193.2	1,225.05	1,225.9	1,218.9
3	1,219.6	1,223.4	1,220.3	1,216.2	1,206.8	1,215.5	1,222.2	1,209.3	1,193.0	1,224.7	1,225.8	1,218.5
4	1,219.4	1,223.3	1,220.2	1,216.4	1,206.5	1,219.9	1,222.8	1,208.6	1,193.3	1,224.2	1,225.7	1,218.2
5	1,219.4	1,223.3	1,219.9	1,216.4	1,210.3	1,221.2	1,222.9	1,207.8	1,193.0	1,223.5	1,226.4	1,217.8
6	1,219.4	1,223.8	1,219.6	1,216.1	1,210.6	1,222.8	1,223.8	1,207.1	1,193.5	1,222.8	1,225.2	1,217.4
7	1,219.5	1,222.6	1,219.2	1,215.8	1,210.9	1,224.7	1,222.7	1,206.4	1,193.9	1,223.1	1,225.05	1,217.0
8	1,219.7	1,222.5	1,218.9	1,215.6	1,211.1	1,225.4	1,222.3	1,205.8	1,195.8	1,222.8	1,225.0	1,216.7
9	1,219.8	1,222.1	1,218.5	1,215.2	1,211.4	1,225.5	1,222.3	1,205.1	1,200.8	1,222.9	1,224.9	1,216.4
10	1,219.9	1,221.9	1,218.2	1,214.9	1,211.6	1,225.4	1,221.4	1,204.4	1,208.0	1,222.9	1,224.7	1,216.1
11	1,219.9	1,221.7	1,218.1	1,214.5	1,212.3	1,225.4	1,221.0	1,203.7	1,213.5	1,222.8	1,224.5	1,215.8
12	1,219.9	1,221.9	1,218.1	1,214.2	1,212.8	1,225.1	1,220.5	1,203.0	1,216.2	1,222.6	1,224.2	1,216.1
13	1,220.0	1,222.1	1,218.3	1,213.7	1,212.8	1,224.9	1,220.0	1,202.3	1,217.8	1,222.2	1,224.0	1,216.8
14	1,220.2	1,223.1	1,218.6	1,213.2	1,212.8	1,224.4	1,219.5	1,201.6	1,219.9	1,222.0	1,223.7	1,217.0
15	1,220.4	1,223.9	1,218.5	1,212.5	1,212.7	1,226.8	1,218.9	1,200.8	1,221.2	1,221.7	1,223.5	1,217.0
16	1,221.1	1,223.8	1,218.3	1,212.2	1,212.5	1,226.8	1,218.5	1,200.2	1,222.5	1,222.2	1,223.3	1,216.9
17	1,221.3	1,223.7	1,218.1	1,211.8	1,212.3	1,226.1	1,218.1	1,199.6	1,225.5	1,223.3	1,223.1	1,216.8
18	1,221.4	1,223.6	1,217.8	1,211.3	1,212.2	1,225.4	1,217.7	1,199.8	1,226.5	1,225.0	1,222.8	1,216.8
19	1,221.5	1,223.4	1,217.9	1,210.9	1,212.3	1,225.0	1,217.4	1,199.5	1,226.0	1,226.0	1,222.6	1,216.6
20	1,222.6	1,223.2	1,217.6	1,210.4	1,212.1	1,224.5	1,216.8	1,199.2	1,225.8	1,225.8	1,222.3	1,216.5
21	1,223.3	1,223.0	1,217.3	1,209.9	1,211.9	1,223.8	1,216.5	1,198.8	1,226.7	1,225.7	1,222.0	1,216.2
22	1,223.5	1,222.7	1,217.1	1,209.4	1,211.8	1,223.5	1,216.1	1,198.0	1,227.5	1,225.5	1,221.6	1,216.0
23	1,223.6	1,222.4	1,216.8	1,208.8	1,212.0	1,223.4	1,215.7	1,197.4	1,226.8	1,225.6	1,221.1	1,216.6
24	1,223.7	1,222.1	1,216.4	1,208.4	1,213.3	1,223.9	1,215.3	1,197.0	1,226.2	1,225.4	1,220.7	1,216.2
25	1,223.7	1,221.9	1,215.9	1,207.9	1,214.5	1,224.3	1,215.2	1,196.0	1,226.0	1,225.4	1,220.4	1,215.2
26	1,223.7	1,221.5	1,215.4	1,207.4	1,214.7	1,223.9	1,214.7	1,195.0	1,226.7	1,225.35	1,220.2	1,215.0
27	1,223.5	1,221.1	1,214.9	1,207.0	1,214.6	1,223.5	1,213.2	1,194.3	1,226.6	1,225.25	1,219.9	1,214.8
28	1,223.4	1,220.8	1,214.5	1,206.8	1,214.5	1,223.4	1,212.8	1,193.9	1,226.7	1,225.2	1,219.6	1,214.8
29	1,223.2	1,220.7	1,214.2	1,206.5	1,214.5	1,223.3	1,212.9	1,193.9	1,226.7	1,225.05	1,219.4	1,214.7
30	1,223.1	1,220.6	1,213.9	1,207.2	1,214.3	1,222.8	1,212.0	1,193.9	1,226.0	1,225.05	1,219.4	1,215.3
31	1,223.0	1,220.6	1,213.9	1,207.0	1,214.3	1,222.5	1,211.4	1,193.9	1,226.7	1,225.05	1,219.4	1,215.3

WEST CANADA CREEK AT HINCKLEY

Location.—About a mile below Hinckley dam at Hinckley, Oneida county, and one-fourth mile below New York Central railroad bridge.

Drainage area.—373 square miles (measured on topographic maps).

Records available.—June 14, 1919, to June 30, 1921.

Gage.—Gurley 7-day graph water-stage recorder on the right bank, about 1 mile below Hinckley dam. Recorder inspected by Charles D. Cady, gate tender at State dam.

Discharge measurements.—Made from a cable about 1,000 feet upstream from gage.

Channel and control.—Large boulders on solid rock bottom; practically permanent.

Extremes of discharge.—Maximum stage during the year from water-stage recorder 7.48 feet from 6 to 8 A. M. March 22 (discharge, 7,020 second-feet); minimum stage from water-stage recorder, 2.61 feet at 6:30 P. M. September 18 (discharge, 16 second-feet).

1919–1921: Maximum stage that of March 22, 1921; minimum stage from water-stage recorder 2.53 feet at 12:30 P. M. August 31, 1919 (discharge, 8 second-feet), caused by closing of gates in dam.

Ice.—Stage-discharge relation not affected by ice.

Regulation.—Seasonal flow regulated by storage in Hinckley reservoir, Consolidated Water Company's reservoir on Black creek at Grey and several small lakes. Diurnal flow affected slightly at low stages by operation of the Fibre Company mill at Hinckley.

Diversion.—Consolidated Water Company of Utica diverts water supply for Utica from Hinckley reservoir.

Accuracy.—Stage-discharge relation permanent. Rating curve well defined between 100 and 4,000 second-feet. Operation of water-stage recorder satisfactory throughout the year. Daily discharge ascertained by applying to rating table mean daily gage height determined by inspection of gage height graph, or for days of considerable fluctuation by averaging discharge for intervals of the day. Records good.

Coöperation.—Station installed by Utica Gas and Electric Company. Maintained by United States Geological Survey in coöperation with the State Engineer and Surveyor.

Discharge measurements of WEST CANADA CREEK AT HINCKLEY, during the year
ending June 30, 1921

DATE	Made by	Gage height	Discharge
		<i>Feet</i>	<i>Sec.-ft.</i>
July 21.....	S. M. Currier.....	3.77	402
Sept. 28.....	Lamoureux and Lauterbach.....	4.20	726
Jan. 30.....	Harrington and Currier.....	4.60	1,090
May 18.....	Howe and Currier.....	4.28	775

Daily discharge, in second-feet, of WEST CANADA CREEK AT HINCKLEY, for the year
ending June 30, 1921

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1....	424	490	620	700	700	660	1,180	1,060	870	2,780	1,550	740
2....	408	520	620	700	700	700	1,180	1,060	825	2,600	1,760	740
3....	408	550	620	700	700	700	1,180	1,010	825	2,440	1,480	740
4....	398	550	620	700	700	700	1,180	1,010	825	2,440	1,240	740
5....	398	544	620	700	700	700	1,180	1,010	825	2,440	1,010	740
6....	408	538	620	700	700	700	1,180	1,010	825	1,720	870	740
7....	424	550	620	700	700	700	1,180	960	825	1,300	780	740
8....	418	550	620	700	700	960	1,180	960	870	1,300	780	660
9....	413	550	620	700	700	1,120	1,180	960	960	1,300	780	585
10....	429	550	620	700	700	1,060	1,180	960	1,060	1,300	780	514
11....	440	550	620	700	740	1,100	1,180	960	1,240	1,300	740	479
12....	445	550	620	700	740	1,180	1,180	915	1,420	1,300	740	462
13....	445	550	620	700	780	1,500	1,180	915	1,420	1,060	780	462
14....	445	550	620	700	780	1,830	1,180	870	1,420	960	740	456
15....	434	550	620	700	780	4,590	1,180	870	1,420	870	740	456
16....	434	550	660	700	780	4,830	1,120	870	1,480	740	740	456
17....	440	585	700	700	780	3,180	1,120	870	2,180	740	740	456
18....	429	620	361	700	780	2,280	1,120	870	3,380	1,000	740	468
19....	445	620	293	660	780	1,970	1,120	870	2,780	1,830	780	462
20....	434	620	700	700	780	1,900	1,120	870	2,440	1,760	780	462
21....	429	620	700	700	780	1,530	1,120	870	4,610	1,420	780	462
22....	434	620	660	700	780	825	1,120	870	6,520	1,300	780	445
23....	434	620	660	700	825	825	1,120	825	4,550	1,300	780	424
24....	429	620	660	660	825	825	1,120	825	3,180	1,180	780	429
25....	413	620	700	660	825	825	1,120	870	2,980	1,180	780	418
26....	424	620	700	660	825	825	1,120	870	4,300	1,060	780	403
27....	434	620	700	700	780	825	1,120	870	4,300	960	780	387
28....	479	620	700	700	780	825	1,120	870	4,560	825	740	387
29....	490	620	700	700	740	960	1,060	.....	4,060	780	740	403
30....	484	620	700	700	620	1,180	1,060	.....	2,780	914	740	398
31....	496	620	.....	700	.....	1,180	1,060	.....	2,600	.....	740	.....

Monthly discharge of WEST CANADA CREEK AT HINCKLEY, for the year ending June 30, 1921

[Drainage area, 373 square miles]

MONTH	DISCHARGE IN SECOND-FEET				RUN-OFF
	Maximum	Minimum	Mean	Per square mile	Depth in inches on drainage area
July.....	496	398	434	1.16	1.34
August.....	620	490	579	1.55	1.79
September.....	700	293	630	1.69	1.89
October.....	700	660	695	1.86	2.14
November.....	825	620	750	2.01	2.24
December.....	4,830	660	1,390	3.73	4.30
January.....	1,180	1,060	1,140	3.06	3.53
February.....	1,060	825	920	2.47	2.57
March.....	6,520	825	2,330	6.25	7.21
April.....	2,780	740	1,400	3.75	4.18
May.....	1,760	740	870	2.33	2.69
June.....	740	387	524	1.40	1.56
The year.....	6,520	293	974	2.61	35.44

NINE MILE FEEDER NEAR HOLLAND PATENT

Location.—At mouth of Nine Mile feeder about 4 miles east of Holland Patent, Oneida county, half a mile below highway bridge near farm of P. A. Wade, which is about 4 miles south and 1 mile west of village of Barneveld.

Records available.—June 5, 1919, to June 30, 1921, when operation of the station was assumed by the State Engineer and Surveyor.

Gage.—Gurley 7-day graph water-stage recorder on right bank, half a mile below highway bridge near farm of P. A. Wade. Recorder inspected by D. C. Humphrey.

Discharge measurements.—Made from highway bridge half a mile upstream from gage, or by wading.

Control.—Suppressed weir of concrete with a lip about 1.5 feet high and a spillway inclined about 1.2. Permanent.

Regulation.—Flow in the feeder is regulated by gates at the intake of the canal just below the power plant at Trenton Falls.

Diversions.—None.

Ice.—Feeder canal not in operation during winter months.

Accuracy.—Daily discharge ascertained by applying mean daily gage heights to rating table, or for days of considerable fluctuation by discharge integration. Rating table well defined between 30 and 200 second-feet. Results good.

Coöperation.—Station maintained by the United States Geological Survey in coöperation with the State Engineer and Surveyor.

Discharge measurements of NINE MILE FEEDER NEAR HOLLAND PATENT, during
the year ending June 30, 1921

DATE	Made by	Gage height	Dis- charge
		<i>Feet</i>	<i>Sec.-ft.</i>
July 15.....	B. F. Howe.....	1.47	83.1
Sept. 28.....	Lauterhahn and Lamoureux.....	1.51	87.1
Nov. 15.....	Lauterhahn and Currier.....	.87	40.8
Nov. 15.....	Currier and Lauterhahn.....	.88	42.7

Daily discharge, in second-feet, of NINE MILE FEEDER NEAR HOLLAND PATENT, for
the year ending June 30, 1921

DAY	July	Aug.	Sept.	Oct.	Nov.	May	June
1.....	86	81	90	86	47	.....	119
2.....	86	79	89	81	48	.....	120
3.....	86	80	88	80	49	.....	122
4.....	86	79	87	78	45	.....	120
5.....	85	78	87	75	44	.....	121
6.....	85	78	89	73	42	.....	123
7.....	85	78	90	72	42	.....	121
8.....	83	85	87	70	42	.....	118
9.....	83	86	86	70	44	.....	118
10.....	84	86	87	69	45	.....	117
11.....	82	85	86	67	41	.....	117
12.....	84	84	88	66	42	.....	115
13.....	83	84	87	66	41	.....	116
14.....	85	82	84	64	41	.....	114
15.....	84	82	84	63	41	.....	114
16.....	83	83	86	61	41	.....	114
17.....	83	82	84	58	57	.....	114
18.....	83	82	79	58	46	.....	116
19.....	87	82	65	57	43	.....	114
20.....	83	82	97	56	43	120	114
21.....	82	83	63	55	42	120	114
22.....	82	88	61	54	.....	121	114
23.....	82	90	61	49	.....	120	114
24.....	83	90	60	47	.....	120	114
25.....	82	90	95	46	.....	122	114
26.....	82	90	93	46	.....	120	113
27.....	81	90	91	47	.....	120	113
28.....	82	89	89	47	.....	120	121
29.....	81	90	86	46	.....	121	126
30.....	81	91	86	45	.....	121	124
31.....	82	90	.....	45	.....	120	.....

Monthly discharge of NINE MILE FEEDER NEAR HOLLAND PATENT, for the year ending June 30, 1921

MONTH	DISCHARGE IN SECOND-FEET		
	Maximum	Minimum	Mean
July.....	87	81	83.4
August.....	91	78	84.5
September.....	97	60	83.5
October.....	86	45	61.2
November 1-21.....	57	41	44.1
May 20-31.....	122	120	120
June.....	126	113	117

WEST CANADA CREEK AT KAST BRIDGE

Location.—In the hamlet of Kast Bridge, Herkimer county, about 4 miles upstream from the junction with Mohawk river at Herkimer.

Drainage area.—575 square miles (from report of State Engineer).

Records available.—October 1, 1920, to June 30, 1921.

Gage.—Gurley 7-day graph water-stage recorder on left bank, about 500 feet below highway bridge. Recorder inspected by engineers from the Herkimer office of the New York State Engineer and Surveyor.

Discharge measurements.—Made from downstream side of highway bridge, or by wading.

Channel and control.—Small boulders and coarse gravel, probably permanent under present regulated flood flows.

Extremes of discharge.—Maximum stage during the period from water-stage recorder, 5.27 feet at 9 A. M. March 22 (discharge, 6,400 second-feet); minimum stage from water-stage recorder, 1.25 feet at 3 A. M. June 27 (discharge, 164 second-feet).

Ice.—Stage-discharge relation probably not affected by ice.

Regulation.—Seasonal flow regulated by storage in Hinckley reservoir. Consolidated Water Company's reservoir on Black creek at Gray and several small lakes. Diurnal flow affected by operation of mills and power plants upstream.

Diversions.—Consolidated Water Company of Utica diverts water supply for Utica from Hinckley reservoir. Water is diverted below the Trenton Falls power plant during the navigation season through the Nine Mile feeder and Nine Mile creek, into the Barge canal.

Accuracy.—Stage-discharge relation permanent. Rating curve very well defined between 300 and 3,000 second-feet. Operation of water-stage recorder satisfactory throughout the year. Daily discharge ascertained by discharge integration. Records good.

Coöperation.—Station installed by Utica Gas and Electric Company. Maintained by United States Geological Survey in coöperation with the State Engineer and Surveyor.

Discharge measurements of WEST CANADA CREEK AT KAST BRIDGE, during the year ending June 30, 1921

DATE	Made by	Gage height	Discharge
		<i>Feet</i>	<i>Sec.-ft.</i>
Sept. 29.	Lauterhahn and Lamoureux.		659
Oct. 11.	Currier and Lamoureux.	2.27	938
Oct. 22.	Currier and Lamoureux.	1.80	450
Oct. 22.	Currier and Lamoureux.	1.82	471
Jan. 31.	Currier and Harrington.	2.56	1,310
Mar. 1.	S. M. Currier.	2.72	1,500
Mar. 12.	S. M. Currier.	3.10	2,090
Mar. 25.	S. M. Currier.	3.67	3,060
April 20.	B. F. Howe.	3.12	2,110
May 20.	Howe and Currier.	2.20	861

Daily discharge, in second-feet, of WEST CANADA CREEK AT KAST BRIDGE, for the year ending June 30, 1921

DAY	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.	800	911	1,800	1,410	1,170	1,500	3,630	1,890	631
2.	800	851	2,780	2,240		1,800	3,120	2,080	624
3.	810	1,420	1,300	2,080		2,800	2,870	1,890	630
4.	865	903	1,140	1,700		1,680	2,810	1,560	589
5.	772	809	2,900	1,740		1,200	2,740	1,300	622
6.	750	753	2,320	1,710	1,290	2,360	2,420	1,130	661
7.	732	771	1,560	1,450	1,180	3,270	1,620	900	612
8.	731	832	1,190	1,490	1,100	3,820	1,620	794	592
9.		991	1,350	1,440	1,110	3,850	1,580	805	435
10.		1,320	1,290	1,370	1,090	2,400	1,550	723	463
11.		909	1,260	1,870	1,090	1,910	1,510	720	370
12.	698	902	1,420	1,340	1,050	2,140	1,480	729	414
13.	733	857	1,520	1,240	1,070	2,700	1,420	731	393
14.	722	866	4,280	1,300	1,070	2,170	1,160	692	379
15.	694	923	4,630	1,540	1,010	2,180	1,100	730	347
16.	696	863	4,980	1,440	1,200	3,140	1,000	769	333
17.	655	1,630	3,620	1,300	2,440	2,300	1,800	705	332
18.	762	1,420	2,710	1,250	1,370	3,500	1,660	692	340
19.	693	1,180	2,180	1,250	1,180	3,000	2,200	693	306
20.	665	1,150	2,100	1,300	1,130	4,060	2,140	679	337
21.	698	1,060	2,050	1,500	1,040	4,490	1,880	647	300
22.	661	1,330	1,090	1,950	1,040	6,100	1,850	658	310
23.	651	4,240	1,420	1,810	1,020	4,850	1,700	741	342
24.	599	1,980	1,380	1,370	1,000	3,660	1,660	666	287
25.	701	1,180	1,040		1,000	3,340	1,480	743	304
26.	642	1,130	772		1,020	4,420	1,340	712	250
27.	676	1,020	904		959	4,440	1,190	660	229
28.	793	995	1,100		1,460	4,560	1,070	632	286
29.	705	1,060	1,020			4,560	959	705	334
30.	680	825	1,480	1,330		3,440	1,170	766	501
31.	657		1,420	1,280		3,000		721	

NOTE.—Mean daily discharge estimated from hydrograph as follows: Oct. 9–11, 700 second-feet; Jan. 25–29, 1,350 second-feet; Feb. 2–5, 1,250 second-feet; recorder did not operate. Discharge for following days estimated on account of faulty gage-height record; Oct. 1, 2, Jan. 18–21, March 17–19, April 9, 15, 16, 22, 23, May 6, 7, June 11.

Monthly discharge of WEST CANADA CREEK AT KAST BRIDGE, for the year ending
June 30, 1921
[Drainage area, 575 square miles]

MONTH	DISCHARGE IN SECOND-FEET				RUN-OFF
	Maximum	Minimum	Mean	Per square mile	Depth in inches on drainage area
October.....	865	599	714	1.24	1.43
November.....	4,240	753	1,170	2.03	2.26
December.....	4,980	• 772	1,930	3.36	3.87
January.....	2,240	.....	1,480	2.57	2.96
February.....	2,440	959	1,180	2.05	2.14
March.....	6,100	1,200	3,180	5.53	6.38
April.....	3,630	959	1,790	3.11	3.47
May.....	2,080	632	899	1.56	1.80
June.....	661	229	418	.727	.81
The period.....	6,100	229	1,420	2.47	25.12

EAST CANADA CREEK DESCRIPTION

East Canada creek rises in Hamilton county and flows southward between Herkimer and Fulton counties, joining the Mohawk at East Creek about 6½ miles below Little Falls. Water is diverted from this creek and from Beaver creek, one of the tributaries at Diamond Hill, and is carried to Little Falls through a cast-iron conduit 9 miles long.

EAST CANADA CREEK AT DOLGEVILLE

Gages 222 and 223

Location.— At the power plant of the Utica Gas and Electric Company, about 1 mile below the village of Dolgeville.

Drainage area.— 257 square miles.

Records available.— Discharge, September 23, 1898, to June 30, 1918. Water-surface elevations, September 23, 1898, to June 30, 1921.

Gage.— Above dam, a reference point on the right abutment; lower gage, staff on side wall of the tail-race.

Discharge.— Discharge withheld pending more accurate rating of flow through the turbines.

Coöperation.— Station established by the United States Board of Engineers on Deep Waterways; maintained by the United States Geological Survey from 1900 to 1907; since 1907 maintained by this Department.

SCHOHARIE CREEK

DESCRIPTION OF BASIN

The Schoharie creek drains the northern slope of the Catskill mountains, it flows in a northerly direction and empties into the Mohawk river about 5 miles west of the city of Amsterdam.

The board of water supply of the city of New York is building a dam on the Schoharie creek at Gilboa for an additional water supply. A tunnel about 18 miles long, beginning at a point on the creek near the county line north of Prattsville, will carry the water to the Esopus creek in the vicinity of Allaben, whence it will follow the natural course of the Esopus creek until it empties into the Ashokan reservoir. The area diverted will be approximately 314 square miles.

SCHOHARIE CREEK AT PRATTSVILLE

Location.— On upstream side of highway bridge at Prattsville. Automatic gage is located on downstream side, left bank.

Drainage area.— 236 square miles.

Records available.— January 1, 1903, to June 30, 1921.

Gage.— Standard Board of Water Supply chain gage and Friez automatic water-stage recorder. Gage is read twice daily.

Discharge measurements.— From highway bridge; at low stages by wading 600 feet downstream from bridge.

Control.— Gravel bed, some small boulders. Affected by extreme freshets. Clear span, 187.5 feet. During low stages, dead water from Sta. 60 upward. Channel above bridge straight for about 300 feet. Channel below bridge straight for about 600 feet, with tendency to bifurcate at this point, where wading measurements are made. Both banks high, clean, and not liable to overflow except in extreme freshets.

Extremes of discharge.— 1907–1921: Maximum stage recorded, 13.50 feet on March 12, 1920, at 3:30 P. M.; discharge, 16,500 second-feet. Minimum stage recorded, 4.13 feet on August 3, 1913; discharge, 5 second-feet.

Winter flow.— Discharge relation seriously affected by ice conditions. Flow determined by meter measurements and climatological data.

Accuracy.— Discharge rating curve fairly well defined. Beginning October 1, 1915, discharge is computed from record of automatic water-stage recorder.

Coöperation.— Maintained by Board of Water Supply of the city of New York.

GAGING OF STREAMS: MOHAWK RIVER BASIN 205

Mean daily flow of SCHOHARIE CREEK AT PRATTSVILLE, for the year ended June 30, 1921

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1	189	240	149	*5,911	207	1,926	302	*105	149	1,866	1,931	159
2	189	182	114	1,672	211	*3,544	566	100	270	1,096	1,378	138
3	270	136	107	1,033	1,236	1,838	483	98	2,258	835	970	*129
4	330	112	98	760	644	1,340	354	95	1,188	676	*756	328
5	219	112	83	658	483	3,052	364	124	543	586	851	220
6	189	110	78	554	406	2,318	400	114	1,792	513	787	*181
7	165	110	219	481	350	1,380	316	107	2,760	466	599	153
8	152	130	162	400	311	953	298	100	3,201	427	489	118
9	127	142	130	364	284	745	275	93	*4,839	438	427	102
10	114	124	248	298	288	680	266	88	*3,698	427	*359	87
11	105	400	321	293	244	631	252	83	1,600	379	312	81
12	136	506	1,283	288	211	512	244	81	1,159	345	277	84
13	293	340	730	279	231	455	235	78	1,510	317	531	75
14	207	427	461	252	196	3,752	227	76	1,208	299	811	84
15	340	350	359	223	189	3,527	970	*76	*1,033	312	537	*64
16	223	560	307	231	211	1,768	483	438	*1,123	374	421	54
17	162	624	252	244	450	1,207	340	1,302	970	1,060	350	62
18	136	385	203	223	579	903	219	427	*771	967	317	59
19	215	326	182	207	427	708	172	316	586	926	286	62
20	248	279	162	*203	400	579	155	257	593	734	243	*40
21	189	231	152	193	466	530	*196	219	*640	633	231	*32
22	142	215	139	182	530	478	186	193	676	573	212	52
23	*279	207	133	175	1,114	592	172	203	531	1,069	205	39
24	524	169	112	175	970	530	155	175	466	2,730	205	39
25	385	162	105	172	753	433	142	155	*1,853	1,308	202	35
26	279	139	102	175	624	326	130	136	1,338	875	220	35
27	219	124	*98	179	560	364	122	127	1,078	626	171	78
28	189	114	112	395	536	364	114	124	875	567	153	57
29	162	124	162	*354	530	360	124	.....	741	549	165	78
30	136	124	672	350	494	354	119	.....	613	2,258	243	135
31	127	133	.....	244	.....	316	112	.....	599	.....	198	.....

* Meter measurement. New rating curve in effect March 3. Ice conditions: January 1, 8 to 14, January 19 to February 15, February 20 to March 2.

Monthly discharge of SCHOHARIE CREEK AT PRATTSVILLE, for the year ending June 30, 1921

[Drainage area, 236 square miles]

MONTH	DISCHARGE IN SECOND-FEET				RUN-OFF Depth in inches on drainage area
	Maximum	Minimum	Mean	Per square mile	
July	524	105	213	0.90	1.044
August	624	110	237	1.00	1.158
September	1,283	78	248	1.05	1.173
October	5,911	172	553	2.34	2.703
November	1,236	189	71	2.00	2.227
December	3,752	316	1,170	4.96	5.714
January	970	112	274	1.16	1.338
February	1,302	76	196	0.83	0.866
March	4,839	149	1,312	5.56	6.410
April	2,730	299	808	3.42	3.818
May	1,931	153	479	2.03	2.336
June	326	32	95	0.40	0.450
The year	5,911	32	504	2.14	29.237

ESOPUS CREEK

DESCRIPTION

Esopus creek has its source in Winnisook lake on the north-western slope of Slide mountain, the highest peak of the Catskills. The Ashokan reservoir, with a water-surface of 12 square miles and a total drainage area above the dam of 257 square miles, is one of the sources of water supply for New York city. This reservoir is on the Esopus creek, about 15 miles above Kingston.

Drainage areas of ESOPUS CREEK *

(From U. S. G. S. topographic maps)

LIMITS	AREA IN SQUARE MILES	
	Place to place	Total
<i>Beaver Kill (Mink Hollow)</i>		
Source to about $\frac{1}{2}$ mile north of Lake Hill	8.42	8.42
<i>ESOPUS CREEK</i>		
Source to Coldbrook, at highway bridge	183.72	192.14
Coldbrook to Olive Bridge dam	64.38	256.52
Olive Bridge dam to pulp-mill, about $1\frac{1}{2}$ miles south of Brown Station	7.01	263.53
Pulp-mill to Kingston, at highway bridge	53.54	317.07
<i>Saw Kill</i>		
Source to about $4\frac{1}{2}$ miles below Woodstock	32.99	.....
<i>ESOPUS CREEK</i>		
Kingston to Leggs Mills, about $\frac{1}{2}$ mile northwest of Lake Katrine railroad station	19.72	369.78
<i>Plattekill Creek</i>		
Source to below pond, about 2 miles east of West Saugerties	17.35	387.13
<i>ESOPUS CREEK</i>		
Leggs Mills to Glenerie, about 1 mile south of Mount Marion station at dam below W. S. R. R. bridge	28.95	416.08
Glenerie to Mount Marion, at highway bridge	2.13	418.21
Mount Marion to Saugerties, at dam below highway bridge	6.00	424.21

* This table of drainage areas is the result of a joint determination of areas, based on independent computations by the engineers of the Board of Water Supply of the city of New York and of the Department of State Engineer.

ESOPUS CREEK AT COLDBROOK

Location.—At highway bridge, about 1,000 feet above Coldbrook railroad station on U. and D. railroad; about 6 miles west of Ashokan.

Drainage area.—192 square miles (measured on United States Geological Survey topographic maps).

Records available.—August 27, 1913, to June 30, 1921.

Gages.—Standard B. W. S. chain gage, read twice daily. On June 15, 1916, a Friez automatic register was installed. These gages are located on the downstream side of the highway bridge.

Discharge measurements.—At low stages, made by wading; at high stage, from the highway bridge (clear span of 160 feet).

Control.—Coarse gravel, apparently permanent, and numerous small boulders and some riprap. Channel above station straight

for about 300 feet; water swift. Channel below station straight for about 1,000 feet; water swift. Right bank high, grassed and largely covered with brush, not liable to overflow. Left bank high, wooded, not liable to overflow.

Extremes of discharge.—1913–1921: Maximum stage recorded, 12.75 feet on November 9, 1913, at 8 P. M.; discharge, about 21,400 second-feet. Minimum stage recorded, 3.21 feet on October 14, 1914; discharge, 8 second-feet.

Winter flow.—Discharge relation seriously affected by ice. Flow determined by meter and float measurements and climatological data.

Accuracy.—Discharge rating curve well defined up to a gage height of 10 feet.

Coöperation.—Established and maintained by the Board of Water Supply of the city of New York. Turbidity and climatological observations are made at this station.

Mean daily flow of ESOPUS CREEK AT COLDBROOK, for the year ending June 30, 1921

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	198	222	136	2,226	*207	1,470	295	192	565	1,710	1,550	219
2.....	279	198	116	*920	222	2,418	490	186	523	1,280	1,290	*200
3.....	*565	186	110	619	800	1,600	460	180	1,200	1,037	1,055	200
4.....	339	174	108	490	589	1,200	380	177	938	888	864	235
5.....	241	155	98	420	485	1,650	385	195	653	765	786	200
6.....	210	153	116	343	410	1,670	415	180	848	667	667	181
7.....	198	150	201	307	365	1,280	347	169	1,580	601	571	170
8.....	198	143	140	279	347	965	351	155	2,178	553	490	167
9.....	*174	120	118	245	331	786	311	153	4,469	547	435	152
10.....	163	125	160	219	303	695	259	*151	3,789	475	375	140
11.....	143	171	189	195	275	595	252	145	1,998	425	339	136
12.....	291	204	283	166	255	517	245	143	1,460	390	311	133
13.....	375	210	255	158	235	465	198	138	1,500	370	667	*120
14.....	248	331	219	150	225	4,673	465	136	1,320	335	632	116
15.....	283	327	192	140	216	*4,180	779	134	1,120	390	517	112
16.....	222	405	180	131	*216	2,053	529	238	1,140	465	455	106
17.....	198	420	153	131	695	1,390	465	595	*1,001	1,190	415	*106
18.....	183	*291	145	129	553	1,001	323	295	816	1,240	370	110
19.....	287	299	127	129	450	800	238	228	681	1,082	335	98
20.....	*245	241	127	125	415	674	207	204	613	896	311	91
21.....	210	213	123	114	405	571	425	210	625	779	279	87
22.....	222	219	118	114	420	517	415	222	613	681	252	84
23.....	335	201	104	106	1,470	716	343	207	535	1,965	245	84
24.....	737	177	98	102	1,250	577	287	192	553	3,050	225	84
25.....	535	166	92	102	929	470	267	155	2,870	1,770	255	78
26.....	430	150	87	102	779	380	248	*166	2,042	1,330	228	75
27.....	*351	138	84	114	646	415	235	189	1,670	1,010	207	75
28.....	315	131	87	255	559	405	*228	529	1,400	840	201	85
29.....	275	143	87	259	500	355	219	.....	1,130	840	252	*106
30.....	252	131	420	238	450	339	207	.....	929	1,888	307	122
31.....	228	136	.....	210	.....	319	198	.....	912	.....	235	.....
Mean...	288	204	149	298	500	1,134	338	209	1,344	982	488	129

* Meter measurement. Ice conditions; January 19 to 20, January 25 to February 16. Flow based on meter measurements and climatological data. New rating table for low flows in effect June 1.

Monthly discharge of ESOPUS CREEK AT COLDBROOK, for the year ending June 30, 1921
[Drainage area, 192 square miles]

MONTH	DISCHARGE IN SECOND-FEET				RUN-OFF
	Maximum	Minimum	Mean	Per square mile	Depth in inches on drainage area
July.....	737	143	288	1.50	1.730
August.....	420	120	204	1.06	1.224
September.....	420	84	149	0.78	0.866
October.....	2,226	102	298	1.55	1.787
November.....	1,470	207	500	2.60	2.905
December.....	4,673	319	1,134	5.91	6.809
January.....	779	198	338	1.76	2.025
February.....	565	134	209	1.09	1.136
March.....	4,469	523	1,344	7.00	8.074
April.....	3,050	335	982	5.11	5.709
May.....	1,550	201	488	2.54	2.927
June.....	235	75	129	0.67	0.751
The year.....	4,673	75	505	2.63	35.943

RONDOUT CREEK

DESCRIPTION

Rondout creek has its source in the heart of the timber-covered mountain group forming Wittenberg chain. It flows southeasterly to Napanoch, turns abruptly to the northeast and enters the Hudson river at Rondout. Notable waterfalls occur at Honk falls and Napanoch over Hudson river shale, and on Good Beer kill above Ellenville. At Honk falls a natural declivity afforded a fall of 125 feet, which has been increased to 147.5 feet by the construction of a masonry dam at the head of the gorge.

Water-power was originally developed at Napanoch in 1754. There is in this village a total fall of 115 feet. A series of cascades, involving a descent of about 50 feet, occurs at High Falls, where the water flows over Rosendale cement rock.

Drainage areas of RONDOUT CREEK *

(From U. S. G. S. topographic maps)

LIMITS	AREA IN SQUARE MILES	
	Place to place	Total
Source to Lackawack dam site, at Lackawack.....	94.73	94.73
Lackawack dam site to Lackawack gage, at Wilbur's bridge.....	5.63	100.36
Lackawack gage to Honk falls, about 1 mile above Napanoch.....	1.68	102.04
Honk falls to Alligerville, at highway bridge (including Vernoooy)....	243.78	345.82
Alligerville to High Falls, at High Falls dam.....	19.31	365.13
High Falls to Rosendale, at highway bridge.....	21.17	386.30

* This table is the result of a joint determination of drainage areas, based on independent computations by the engineers of the Board of Water Supply of the city of New York and of the Department of State Engineer.

RONDOUT CREEK AT LACKAWACK

Location.—At highway bridge, known as Wilbur's bridge, about 3 miles from Lackawack on road to Napanoch (reached by Ontario and Western railroad from Kingston to Napanoch and then a distance of 4 miles by Grahamsville stage).

Drainage area.—100 square miles,* determined from United States Geological Survey topographic maps and by special survey of part of watershed line by Board of Water Supply. (1910–1912, inclusive, drainage area considered 104 square miles, based on incomplete data.)

Records available.—May 1, 1910, to June 30, 1921. (Honk Falls† records available, February 13, 1906, to April 30, 1910, inclusive.)

Gage.—Standard Board of Water Supply chain gage, read twice daily, and Friez automatic stage register.

Discharge measurements.—At high stages, from highway bridge; at low stages, by wading at a point about a mile below Wilbur's bridge, where bottom is gravelly.

Control.—Sandy bottom from Station 0 to 45. Station 45 to 85 strewn with boulders. Section apparently permanent. Clear span, 85 feet. Channel above station straight for about 3,000 feet; water swift. Channel below station straight for about 1,000 feet; water swift. Right bank high, wooded. Left bank high, clean.

Extremes of discharge.—1910–1921: Maximum stage recorded, 10.40 feet on November 9, 1913, at 7:30 P. M.; discharge, 14,000 second-feet. Minimum stage recorded, 2.07 feet on October 8, 1914, and 2.11 feet on August 18, 21, 27 and 28, 1918; discharge, 14 second-feet.

Winter flow.—Discharge relation seriously affected by ice when channel is completely frozen over. Flow determined by meter measurements and climatological data.

Accuracy.—Discharge rating curve well defined.

Coöperation.—Established and maintained by Board of Water Supply of the city of New York. Climatological observations are made at this station.

* The 100 square miles used above is checked by the result of a joint determination of drainage areas, based on independent computations by engineers of the Board of Water Supply of the City of New York and of the Department of State Engineer.

† Honk Falls is a short distance below this station.

Mean daily flow of RONDOUT CREEK AT LACKAWACK, for the year ended June 30, 1921

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	119	119	85	1,123	93	780	154	106	472	756	498	90
2.....	98	103	76	368	93	1,000	192	98	380	494	383	83
3.....	190	95	72	244	301	607	209	93	986	395	326	81
4.....	177	89	69	194	178	481	170	92	643	333	282	108
5.....	134	85	64	170	148	638	178	98	376	294	314	89
6.....	116	81	85	156	132	552	192	106	279	264	307	82
7.....	106	84	225	142	128	422	162	134	548	238	258	78
8.....	116	92	119	128	127	350	160	119	846	*222	227	75
9.....	98	79	89	117	127	294	156	112	1,480	279	204	72
10.....	89	89	134	100	136	279	142	109	2,004	252	185	69
11.....	84	213	136	93	124	250	136	111	1,014	225	170	65
12.....	150	235	335	92	124	220	120	100	696	204	160	66
13.....	161	290	208	*96	114	202	108	89	846	190	285	65
14.....	117	410	150	95	112	1,315	194	89	674	176	236	61
15.....	171	281	125	92	106	*1,235	406	86	529	192	187	57
16.....	124	192	116	84	104	643	212	101	494	282	164	*55
17.....	103	*194	113	84	258	472	172	236	438	1,028	*164	57
18.....	93	173	100	84	*212	380	127	190	372	685	158	63
19.....	129	154	92	83	172	326	112	134	314	562	148	56
20.....	113	136	85	82	152	270	106	109	304	422	140	54
21.....	*92	124	81	79	150	236	136	106	298	339	130	50
22.....	92	121	79	76	154	227	160	98	276	291	122	46
23.....	190	121	78	73	937	357	185	95	247	591	120	46
24.....	541	105	69	71	648	301	164	86	241	1,107	116	51
25.....	306	100	72	72	459	236	150	83	762	648	136	47
26.....	199	92	76	71	357	180	140	83	643	490	136	47
27.....	165	85	78	72	304	197	134	98	628	391	116	49
28.....	145	81	79	207	279	207	*140	507	503	330	104	48
29.....	131	93	89	148	250	182	142	.....	446	291	117	67
30.....	122	101	228	130	222	172	130	.....	372	503	122	93
31.....	116	90	.....	106	.....	166	122	.....	353	.....	101	.....
Mean...	148	139	114	153	223	425	162	124	596	416	197	66

* Meter measurement. New rating curve in effect October 1. Ice conditions; January 12 to 13, 19 to 22, January 25 to February 6, February 20 to 27.

Monthly discharge of RONDOUT CREEK AT LACKAWACK, for the year ended June 30, 1921

[Drainage area, 100 square miles]

MONTH	DISCHARGE IN SECOND-FEET				RUN-OFF Depth in inches on drainage area
	Maximum	Minimum	Mean	Per square mile	
July.....	541	84	148	1.48	1.705
August.....	410	79	139	1.39	1.598
September.....	335	64	114	1.14	1.268
October.....	1,123	71	153	1.53	1.758
November.....	937	93	223	2.23	2.494
December.....	1,315	166	425	4.25	4.900
January.....	406	106	162	1.62	1.864
February.....	507	83	124	1.24	1.289
March.....	2,004	241	596	5.96	6.868
April.....	1,107	176	416	4.16	4.641
May.....	498	101	197	1.97	2.277
June.....	108	46	66	0.66	0.732
The Year.....	2,004	46	230	2.30	31.394

WALLKILL RIVER AT PELLETS ISLAND MOUNTAIN

Location.—At highway bridge in village of Pellets Island Mountain, about $4\frac{1}{2}$ miles south of Middletown, Orange county, and about $5\frac{1}{2}$ miles below mouth of Pochunck creek.

Drainage area.—385 square miles (measured on topographic map).

Records available.—December 29, 1919, to June 30, 1921.

Gage.—Chain gage on downstream side of highway bridge, installed January 17, 1920. Previous readings were made on temporary staff gage attached to pile on right bank under bridge. Gage read by William Grohoski.

Discharge measurements.—Made from downstream side of highway bridge, or by wading about 2 miles below.

Channel and control.—Channel mostly silt and control coarse gravel; probably fairly permanent.

Extremes of discharge.—Maximum stage recorded during year, 14.86 feet at 5:30 A. M., March 5 (discharge, 3,820 second-feet); minimum stage recorded, 7.50 feet at 7:30 P. M., June 23 (discharge, 38 second-feet).

1920–1921: Maximum stage recorded, 20.7 feet at 7:30 A. M., March 16, 1920 (discharge, 8,350 second-feet); minimum stage, that of current year.

Ice.—Stage-discharge relation usually affected by ice.

Accuracy.—Stage-discharge relation practically permanent. Rating curve well defined between 30 and 3,000 second-feet. Gage readings uncertain during portions of year; estimates have been made for such periods. Records fair.

Coöperation.—Station maintained by the United States Geological Survey in coöperation with the State Engineer and Surveyor.

Discharge measurements of WALLKILL RIVER AT PELLETS ISLAND MOUNTAIN, during the year ended June 30, 1921

DATE	Made by	Gage height	Discharge
		<i>Feet</i>	<i>Sec. ft.</i>
Sept. 3,.....	Currier and Lamoureux.....	8.38	157
Sept. 8,.....	Currier and Lamoureux.....	8.39	156
Oct. 22,.....	Covert and Howe.....	8.85	292
Jan. 24,.....	B. F. Howe.....	10.12	703
Mar. 13,.....	B. F. Howe.....	13.68	2,930
Mar. 13,.....	B. F. Howe.....	13.52	2,730
June 19,.....	Howe and Lauterhahn.....	7.81	90.2

Daily discharge, in second-feet, of WALLKILL RIVER AT PELLETS ISLAND MOUNTAIN,
for the year ended June 30, 1921

DAY	July	Aug.	Sept.	Jan.	Feb.	Mar.	April	May	June
1.....	755	675	238	620	222	1,290	1,040	580	152
2.....	755	595	182	580	210	1,830	1,240	660	132
3.....	940	517	152	620	274	2,560	1,090	580	114
4.....	1,040	446	133	580	302	3,340	940	486	123
5.....	635	446	152	542	317	3,770	860	620	114
6.....	276	319	182	504	468	3,420	820	820	106
7.....	263	250	204	580	580	3,260	700	820	96
8.....	263	226	204	398	580	2,860	620	780	88
9.....	226	204	226	415	542	2,780	620	740	88
10.....	204	226	250	1,470	468	3,590	542	660	74
11.....	152	250	276	1,590	504	3,500	542	542	81
12.....	238	334	319	1,470	504	3,100	486	415	88
13.....	715	517	380	1,530	504	2,780	432	486	88
14.....	990	595	429	1,410	542	2,350	381	820	74
15.....	1,140	595	429	1,290	620	2,070	381	700	67
16.....	1,290	595	481	1,140	620	1,830	432	542	53
17.....	1,470	675	517	940	542	1,650	432	450	53
18.....	1,470	800	517	900	620	1,410	432	364	76
19.....	1,650	755	517	820	660	1,190	542	302	66
20.....	1,590	595	517	.....	620	1,090	542	274	58
21.....	1,410	555	396	.....	700	990	486	248	54
22.....	1,350	517	349	.....	580	900	398	210	48
23.....	1,090	481	334	860	542	780	415	210	42
24.....	755	429	276	780	542	740	660	222	44
25.....	940	396	226	620	542	820	780	235	56
26.....	1,040	364	319	398	486	1,190	700	348	58
27.....	1,040	290	429	332	542	1,090	620	348	56
28.....	940	250	595	288	780	990	542	274	54
29.....	845	226	675	248	.....	900	432	222	54
30.....	755	226	755	261	.....	820	468	174	174
31.....	755	290	.....	261	.....	780	.....	174	.....

NOTE.— Mean daily discharge, Oct. 1-31 estimated at 750 second-feet, Nov. 1-30 at 1,200 second-feet, Dec. 1-31 at 1,500 second-feet, Jan. 20-22 at 1,000 second-feet principally from comparison with Beaver Kill record; gage-heights either missing or of no value. Estimate for single day made July 1.

Monthly discharge of WALLKILL RIVER AT PELLETS ISLAND MOUNTAIN, for the year
ended June 30, 1921

[Drainage area, 385 square miles]

MONTH	DISCHARGE IN SECOND-FEET				RUN-OFF
	Maximum	Minimum	Mean	Per square mile	Depth in inches on drainage area
July.....	1,650	152	870	2.26	2.61
August.....	800	204	440	1.14	1.31
September.....	755	133	355	.923	1.03
October.....	.....	.....	750	1.95	2.25
November.....	.....	.....	1,200	3.12	3.48
December.....	.....	.....	1,500	3.90	4.50
January.....	1,590	248	789	2.05	2.36
February.....	780	210	515	1.34	1.40
March.....	3,770	740	1,920	4.99	5.75
April.....	1,240	381	619	1.61	1.80
May.....	820	174	461	1.20	1.38
June.....	174	42	81.0	.210	.23
The year.....	3,770	42	797	2.07	28.10

DELAWARE RIVER DRAINAGE BASIN

The Delaware river drains the southwestern slope of the Catskill mountains. The two branches flow in a southwestern direction to Hancock where they unite. The river then flows in a southeasterly direction along the State line to Port Jervis, at which point the river turns south and leaves the State.

WEST BRANCH OF DELAWARE RIVER AT HALE EDDY

Location.—At highway bridge in village of Hale Eddy, Delaware county, 8 miles below power dam of Deposit Electric Company and $8\frac{1}{2}$ miles above junction with east branch of Delaware river.

Drainage area.—611 square miles (measured on Post-Route map).

Records available.—November 15, 1912, to June 30, 1921.

Gage.—Vertical staff, in four sections, attached to rocks near the right abutment of the bridge and to the abutment; read by W. J. Shanly.

Discharge measurements.—Made from the cable installed in July, 1916, about 400 feet below the gage. Previous measurements made from the highway bridge or by wading.

Channel and control.—Coarse gravel and boulders; practically permanent.

Extremes of discharge.—Maximum stage recorded during year, 10.5 feet at 8 A. M. March 10 (discharge, 11,200 second-feet); minimum stage recorded, 1.5 feet at 8 A. M. June 27 (discharge, 72 second-feet).

1912-1921: Maximum stage recorded, 15.3 feet at 5 P. M. March 27, 1913 (discharge, 25,000 second-feet); minimum stage recorded, 1.0 foot at 6 P. M. September 21, 1913 (discharge, 34 second-feet).

Ice.—Stage-discharge relation affected by ice.

Accuracy.—Stage-discharge relation practically permanent. Rating curve is well defined between 50 and 24,000 second-feet. Gage read to tenths twice daily. Daily discharge ascertained by applying mean daily gage height to rating table. Open-water records good; records for period of ice effect, fair.

Coöperation.—Station maintained by the United States Geological Survey in coöperation with the State Engineer and Surveyor.

**Discharge measurements of WEST BRANCH OF DELAWARE RIVER AT HALE EDDY,
during the year ended June 30, 1921**

DATE	Made by	Gage height	Discharge
		<i>Feet</i>	<i>Sec.-ft.</i>
Aug. 4.	C. C. Covert.	2.35	288
Jan. 21.	B. F. Howe.	a 4.90	623
Feb. 7.	B. F. Howe.	a 4.98	772
Feb. 22.	B. F. Howe.	a 8.64	663
Mar. 9.	B. F. Howe.	8.12	6,140
June 15.	B. F. Howe.	1.82	136

a Backwater from ice.

**Daily discharge, in second-feet, of WEST BRANCH OF DELAWARE RIVER AT HALE
EDDY, for the year ended June 30, 1921**

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.	380	540	565	7,400	840	2,980	1,210	440	1,900	1,880	3,820	262
2.	280	422	615	4,080	1,070	7,810	1,520	460	2,800	1,790	2,870	245
3.	280	380	422	2,670	1,880	7,010	1,440	600	6,500	1,520	2,570	262
4.	262	360	360	2,270	1,970	5,260	1,210	460	4,350	1,860	2,270	262
5.	195	300	340	1,880	1,880	4,640	1,070	460	2,270	1,280	2,170	228
6.	124	262	320	1,520	1,700	4,350	1,000	600	2,270	1,140	1,700	210
7.	195	180	340	1,210	1,360	3,440	930	850	5,580	1,070	1,440	195
8.	340	195	340	1,070	1,140	2,670	930	500	5,580	1,070	1,210	165
9.	300	165	360	930	1,070	2,270	930	400	6,630	1,000	1,070	165
10.	245	165	422	840	1,070	2,070	870	440	10,200	930	930	180
11.	300	468	1,880	695	930	1,970	850	480	4,640	870	810	150
12.	1,210	1,360	2,770	668	840	1,790	800	400	3,320	750	695	137
13.	930	1,210	2,670	615	750	1,700	750	380	3,320	668	695	114
14.	722	1,360	2,170	615	640	2,070	700	340	2,870	640	810	103
15.	590	1,070	1,700	565	515	4,940	750	360	2,670	590	640	114
16.	515	810	1,280	515	565	4,350	700	360	2,470	590	445	114
17.	400	1,700	930	515	1,610	3,440	650	460	2,270	540	422	103
18.	280	1,520	930	468	2,070	2,870	600	.....	2,170	780	422	114
19.	340	1,210	780	380	1,880	2,170	600	.....	1,880	1,140	340	114
20.	668	870	695	380	1,700	1,520	600	.....	1,790	1,070	340	114
21.	490	722	615	340	1,610	1,360	550	.....	1,700	930	300	103
22.	468	722	540	312	1,440	1,210	1,400	750	1,520	930	300	114
23.	1,210	668	468	280	5,920	1,070	900	850	1,360	1,140	280	94
24.	3,820	565	422	288	5,580	1,000	800	700	1,360	1,360	280	86
25.	2,470	515	380	262	4,350	930	650	650	1,520	1,440	280	94
26.	1,790	422	380	245	2,570	930	550	550	1,700	1,360	300	86
27.	1,360	352	360	262	2,270	780	500	550	1,520	1,140	300	79
28.	1,070	320	668	320	2,070	870	400	1,100	1,520	1,070	300	94
29.	930	565	930	810	1,880	1,070	400	.....	1,520	1,000	300	86
30.	780	565	2,270	930	1,700	1,000	480	.....	1,360	1,790	300	94
31.	615	515	.....	930	.....	930	460	.....	1,210	.....	262	.....

NOTE.—Discharge, January 11–March 3, determined from gage-heights corrected for ice effect; from 3 discharge measurements, study of weather records and comparison with record of Delaware River at Port Jervis. Mean daily discharge February 18–21 estimated at 1,000 second-feet; no gage-height record.

Monthly discharge of WEST BRANCH OF DELAWARE RIVER AT HALE EDDY, for the
year ended June 30, 1921
[Drainage area, 611 square miles]

MONTH	DISCHARGE IN SECOND-FEET				RUN-OFF
	Maximum	Minimum	Mean	Per square mile	Depth in inches on drainage area
July.....	3,820	124	760	1.24	1.43
August.....	1,700	165	661	1.08	1.24
September.....	2,770	320	897	1.47	1.64
October.....	7,400	245	1,110	1.82	2.10
November.....	5,920	515	1,830	3.00	3.35
December.....	7,810	780	2,600	4.26	4.91
January.....	1,520	400	813	1.33	1.53
February.....	1,100	340	612	1.00	1.04
March.....	10,200	1,210	2,960	4.84	5.58
April.....	1,880	540	1,090	1.78	1.99
May.....	3,820	262	931	1.52	1.75
June.....	262	79	143	.234	.26
The year.....	10,200	79	1,210	1.98	26.82

EAST BRANCH OF DELAWARE RIVER AT FISH EDDY

Location.—At railway bridge in village of Fish Eddy, Delaware county, about 4 miles below mouth of Beaver kill and 5½ miles above confluence of east and west branches.

Drainage area.—790 square miles (measured on post-route map).

Records available.—November 19, 1912, to June 30, 1921.

Gage.—Staff, in two sections, on downstream end of left pier of railroad bridge; read by J. P. Lyons.

Discharge measurements.—Made from highway bridge about 200 feet above the gage, or by wading, 300 to 500 feet below.

Channel and control.—Coarse gravel; occasionally shifting.

Extremes of discharge.—Maximum stage recorded during year, 12.76 feet at 4 P. M. March 9 (discharge, 19,600 second-feet); minimum stage recorded, 2.27 feet at 8 A. M. and 4 P. M. June 26 (discharge, 200 second-feet).

1912–1921: Maximum stage 18.0 feet at 8 A. M. March 13, 1920 (stage-discharge relation affected by ice); 17.4 feet during the afternoon of March 27, 1913, determined by leveling from flood marks (discharge, about 33,500 second-feet); minimum stage recorded, 1.64 feet at 5 P. M. October 12, 14 and 15, 1914 (discharge, 97 second-feet).

Ice.—Stage-discharge relation affected by ice.

Accuracy.—Stage-discharge relation changed presumably at time of the spring break-up. Old rating curve was used up to this time and was well defined between 200 and 20,000 second-feet. New rating curve was used after this date and is fairly well defined between 300 and 20,000 second-feet. Gage read to hun-

dredths twice daily. Daily discharge ascertained by applying mean daily gage height to rating table. Open-water records good; records for period of ice effect, fair.

Coöperation.—Gage-height record obtained in coöperation with United States Weather Bureau. Station maintained by the United States Geological Survey in coöperation with the State Engineer and Surveyor.

Discharge measurements of EAST BRANCH OF DELAWARE RIVER AT FISH EDDY, during the year ended June 30, 1921.

DATE	Made by	Gage height	Discharge
		<i>Feet</i>	<i>Sec.-ft.</i>
Sept. 9	Currier and Lamoureux	3.15	688
Feb. 9	B. F. Howe	a 5.09	575
Feb. 23	B. F. Howe	a 6.57	865
Mar. 10	B. F. Howe	11.06	5,100
Mar. 12	B. F. Howe	7.10	5,580
June 16	Otto Lauterhahn	2.52	291
June 16	Howe and Lauterhahn	2.52	300

a Backwater from ice.

Daily discharge, in second-feet, of EAST BRANCH OF DELAWARE RIVER AT FISH EDDY, for the year ended June 30, 1921

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1	745	1,320	620	13,200	2,100	6,000	1,320	440	4,200	2,910	5,510	430
2	650	1,320	590	8,820	2,100	16,100	1,700	460	10,000	2,630	4,690	430
3	620	1,320	590	8,390	3,000	14,500	1,900	440	5,510	2,510	3,610	430
4	1,080	1,240	590	7,970	3,000	9,920	1,500	500	4,690	2,390	3,330	430
5	920	1,240	590	7,160	1,990	5,440	1,240	550	4,530	2,270	3,330	430
6	745	1,240	920	6,000	1,990	5,260	1,160	900	4,530	2,270	2,510	405
7	710	1,080	885	4,390	1,990	5,260	1,080	900	7,350	2,150	2,510	405
8	1,080	920	850	2,790	1,990	4,730	1,080	750	8,150	2,030	2,390	380
9	1,890	620	780	1,690	1,890	3,910	1,080	550	15,800	1,910	2,390	380
10	1,590	455	.....	1,320	1,790	3,050	1,080	480	15,600	1,810	2,270	355
11	1,500	1,240	.....	1,160	1,790	2,550	1,080	420	10,100	1,810	2,270	330
12	2,320	2,320	.....	1,160	1,410	2,430	1,080	400	5,870	1,810	2,150	310
13	1,990	3,320	.....	1,040	1,320	1,990	1,040	480	5,510	1,360	1,610	310
14	1,790	3,760	.....	960	1,320	.....	1,300	420	5,170	1,080	940	310
15	1,590	3,050	.....	920	1,320	.....	2,400	420	5,010	1,030	895	310
16	1,410	2,790	1,890	920	1,320	.....	1,500	650	4,850	985	850	310
17	1,240	2,550	1,500	885	2,790	.....	950	950	4,690	5,010	850	310
18	1,240	2,550	1,320	850	2,550	.....	700	1,200	4,210	4,470	850	310
19	1,160	3,610	1,240	680	2,210	2,920	700	1,200	3,610	4,050	850	286
20	1,160	2,790	1,240	590	2,100	2,790	1,000	850	3,330	3,330	810	258
21	1,160	2,430	1,160	590	2,100	2,670	1,400	1,100	3,050	2,030	770	230
22	1,080	1,500	1,080	590	1,990	2,550	1,600	950	2,910	1,610	770	226
23	2,100	1,000	1,080	560	12,500	2,430	1,400	850	3,190	3,890	770	222
24	9,700	920	1,040	560	9,260	2,320	950	850	2,630	5,330	770	218
25	6,960	885	745	560	7,360	2,320	600	800	4,850	4,850	770	210
26	3,760	710	680	530	5,620	2,320	600	800	4,530	4,530	770	200
27	2,550	710	590	560	4,560	2,100	600	900	4,210	3,890	730	210
28	1,990	710	710	2,320	4,390	1,990	600	1,800	3,610	3,610	730	210
29	1,690	650	710	2,320	4,390	1,990	600	.....	2,770	3,610	680	290
30	1,410	650	2,920	2,100	3,760	1,590	650	.....	2,510	3,750	620	290
31	1,320	620	.....	2,100	.....	1,500	600	.....	2,390	.....	520	.....

NOTE.—Discharge, January 14–March 2, determined from gage-heights corrected for ice effect from 2 discharge measurements, study of weather records and comparison with record of Delaware River at Port Jervis. Discharge estimated September 10–15 at 2,680 second-feet (no gage-height record); November 3–4; December 14–18 at 4,200 second-feet; January 2–4 (gage heights doubtful).

Monthly discharge of EAST BRANCH OF DELAWARE RIVER AT FISH EDDY, for the
year ended June 30, 1921
[Drainage area, 790 square miles]

MONTH	DISCHARGE IN SECOND-FEET				RUN-OFF
	Maximum	Minimum	Mean	Per square mile	Depth in inches on drainage area
July.....	9,700	620	1,910	2.42	2.79
August.....	3,760	455	1,600	2.03	2.34
September.....	.....	590	1,340	1.70	1.90
October.....	13,200	530	2,700	3.42	3.94
November.....	12,500	1,320	3,200	4.05	4.52
December.....	16,100	1,500	4,240	5.37	6.19
January.....	2,400	600	1,110	1.41	1.63
February.....	1,800	400	750	.949	.99
March.....	15,800	2,390	5,460	6.91	7.97
April.....	5,010	985	2,830	3.58	3.99
May.....	5,510	520	1,690	2.14	2.47
June.....	430	200	314	.397	.44
The year.....	16,100	200	2,280	2.89	39.17

DELAWARE RIVER AT PORT JERVIS

Location.—At toll bridge at Port Jervis, Orange county, 1 mile above Neversink river and 6 miles below Mongaup river.

Drainage area.—3,100 square miles. (Revised figure from report of Super-power Survey.)

Records available.—October 12, 1904, to June 30, 1921.

Gage.—Staff in two sections: the upper section vertical and attached to downstream end of left abutment; the lower section inclined, about 30 feet downstream. On March 14, 1920, the facing board of the inclined section was carried out. After that date a chain gage on the bridge was used. Gage read by John Bisland.

Discharge measurements.—Made from the highway bridge or by wading.

Channel and control.—Gravel; occasionally shifting.

Extremes of discharge.—Maximum stage recorded during year, 12.3 feet at 8 A. M. March 10 (discharge, 61,600 second-feet); minimum stage recorded, 1.6 feet at 8 A. M. and 5 P. M. June 23 (discharge, 780 second-feet).

1904-1921: Maximum stage recorded, 16.0 feet at 8 A. M. March 28, 1914 (discharge, 92,700 second-feet); minimum stage recorded, 0.60 foot at 8 A. M. September 22 and 23, 1908 (discharge, 175 second-feet).

Ice.—Stage-discharge relation usually affected by ice during large part of January and February.

Accuracy.—Stage-discharge relation practically permanent. Rating curve fairly well defined below 2,500 second-feet and

well defined between 2,500 and 30,000 second-feet. Daily discharge ascertained by applying mean daily gage height to rating table. Open-water records good except those for low and high stages, which are fair.

Coöperation.—Gage height record obtained in coöperation with United States Weather Bureau. Station maintained by the United States Geological Survey in coöperation with the State Engineer and Surveyor.

Discharge measurements of DELAWARE RIVER AT PORT JERVIS, during the year ended June 30, 1921

DATE	Made by	Gage height	Discharge
		<i>Feet</i>	<i>Sec.-feet</i>
July 31.....	Covert and Grover.....	3.31	4,080
Sept. 4.....	Currier and Lamoureux.....	2.44	1,870
Sept. 4.....	Currie and Lamoureux.....	2.35	1,730
Oct. 22.....	Covert and Howe.....	2.52	2,080
June 17.....	Howe and Lauterhahn.....	1.80	1,030
June 18.....	Howe and Lauterhahn.....	1.81	1,050
June 18.....	Howe and Lauterhahn.....	1.81	985

Daily discharge, in second-feet, of DELAWARE RIVER AT PORT JERVIS, for the year ended June 30, 1921

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	3,180	3,910	2,280	30,500	5,050	8,200	4,750	2,920	8,200	9,840	13,600	2,280
2.....	3,400	3,400	2,070	32,000	5,360	35,000	4,750	2,470	11,200	12,100	16,200	1,890
3.....	3,180	2,920	1,890	17,400	8,200	30,500	6,700	2,690	16,800	11,600	13,600	1,890
4.....	4,460	2,470	1,720	13,100	8,600	24,600	6,010	2,470	38,100	9,840	10,700	1,800
5.....	3,650	2,260	1,550	12,100	9,840	19,200	5,050	2,260	18,000	7,430	9,840	1,550
6.....	3,400	2,070	1,550	11,200	8,200	22,500	4,750	2,260	12,600	6,010	9,010	2,070
7.....	2,470	1,890	2,920	10,300	6,350	18,000	5,050	4,180	16,800	5,680	8,200	1,720
8.....	2,260	1,890	3,160	6,010	6,010	14,600	4,750	3,650	37,300	5,680	7,430	1,550
9.....	2,260	1,720	2,920	4,750	5,050	11,600	4,460	3,160	41,200	5,360	6,350	1,550
10.....	2,070	1,720	3,160	4,180	4,750	9,840	3,910	2,690	58,300	4,750	5,360	1,390
11.....	1,890	1,720	5,360	3,650	4,460	8,600	3,160	2,260	39,600	5,360	4,750	1,240
12.....	1,800	2,260	9,840	3,650	4,180	7,810	3,160	2,260	25,300	4,750	3,910	1,240
13.....	3,650	2,470	15,700	3,400	3,910	7,430	2,920	2,070	22,500	3,650	4,180	1,240
14.....	3,650	5,360	11,600	3,160	3,650	7,060	3,650	1,890	23,900	3,650	4,750	1,240
15.....	4,180	8,600	8,200	2,920	3,400	32,700	3,910	1,890	22,500	3,910	4,180	1,110
16.....	4,180	9,840	6,700	2,470	3,400	23,200	9,840	1,890	16,800	4,180	4,180	1,110
17.....	3,160	7,430	5,360	2,920	3,650	16,800	6,010	2,470	16,800	6,010	3,650	1,110
18.....	2,690	7,060	4,180	2,690	10,700	13,100	3,910	2,070	12,600	13,600	3,160	990
19.....	2,920	6,700	3,910	2,690	9,420	11,200	2,690	7,430	12,100	12,100	2,920	990
20.....	3,160	5,680	3,160	2,470	7,810	8,600	2,690	5,050	10,700	9,840	2,690	990
21.....	3,400	4,750	2,690	2,070	7,430	8,200	2,920	5,680	10,300	9,840	2,260	880
22.....	2,690	4,180	2,470	2,070	6,700	7,430	4,180	3,160	9,840	6,700	2,070	880
23.....	2,920	3,650	2,470	2,260	10,300	7,430	6,350	3,400	8,200	6,700	1,890	780
24.....	8,200	3,160	2,260	2,070	30,500	8,600	6,010	3,650	7,430	12,600	1,800	990
25.....	29,700	2,920	2,260	1,720	21,800	8,200	3,650	2,920	9,420	13,600	2,260	880
26.....	16,800	2,690	2,070	1,720	19,800	7,060	2,470	2,470	12,600	10,700	2,690	998
27.....	10,700	2,260	2,070	1,720	17,400	5,050	2,470	3,160	14,600	9,010	2,260	880
28.....	7,810	2,070	1,890	2,070	15,700	4,750	2,470	2,690	12,600	7,810	2,260	880
29.....	6,010	1,890	4,180	4,460	9,840	5,360	2,470	.....	10,700	7,060	1,890	880
30.....	4,750	2,260	4,750	5,360	9,010	5,360	2,920	.....	9,010	6,700	2,260	1,110
31.....	4,180	2,470	.....	5,050	.....	5,360	2,920	.....	9,010	.....	2,470	.....

Monthly discharge of DELAWARE RIVER AT PORT JERVIS, for the year ended June 30, 1921

[Drainage area, 3,100 square miles]

MONTH	DISCHARGE IN SECOND-FEET				RUN-OFF
	Maximum	Minimum	Mean	Per square mile	Depth in inches on drainage area
July.....	29,700	1,800	5,120	1.65	1.90
August.....	8,600	1,720	3,670	1.18	1.36
September.....	15,700	1,550	4,140	1.34	1.50
October.....	32,000	1,720	6,520	2.10	2.42
November.....	30,500	3,400	9,020	2.91	3.25
December.....	35,000	4,750	13,000	4.19	4.83
January.....	9,840	2,470	4,220	1.36	1.57
February.....	7,430	1,890	3,040	.981	1.02
March.....	58,300	7,430	18,500	5.97	6.88
April.....	13,600	3,650	7,870	2.54	2.83
May.....	16,200	1,800	5,250	1.69	1.95
June.....	2,280	780	1,270	.410	.46
The year.....	58,300	780	6,850	2.21	29.97

BEAVER KILL AT COOKS FALLS

Location.—At covered highway bridge in Cooks Falls, Delaware county.

Drainage area.—236 square miles (measured on post route and topographic maps).

Records available.—July 25, 1913, to June 30, 1921.

Gage.—Vertical staff in three sections, bolted to rock on left bank under the bridge; read by H. B. Couch.

Discharge measurements.—Made from the bridge or by wading.

Channel and control.—Coarse gravel, boulders, and solid ledge; practically permanent.

Extremes of discharge.—Maximum stage recorded during year, 9.2 feet at 7 P. M. March 9 (discharge, 5,640 second-feet); minimum stage recorded, 1.20 feet at 11 A. M. and 7 P. M. June 28 (discharge, 94 second-feet).

1913-1921: Maximum stage recorded, 12.4 feet at 5 P. M. October 30, 1917 (discharge, about 9,700 second-feet); minimum stage recorded, 0.70 foot from 7 A. M. October 12 to 7 A. M. October 13, 1916 (discharge, 30 second-feet).

Ice.—Stage-discharge relation somewhat affected by ice.

Accuracy.—Stage-discharge relation practically permanent. Rating curve well defined between 300 and 4,000 second-feet. Gage read twice daily to hundredths. Discharge ascertained by applying mean daily gage height to rating table. Open-water records good; records for period of ice effect fair.

Coöperation.—Station maintained by the United States Geological Survey in coöperation with the State Engineer and Surveyor.

Discharge measurements of BEAVER KILL AT COOKS FALLS, during the year ended June 30, 1921

DATE	Made by	Gage height	Discharge
		<i>Feet</i>	<i>Sec.-feet</i>
Aug. 3.....	C. C. Covert.....	2.20	340
Sept. 8.....	Covert and Lamoureux.....	1.86	218
Oct. 23.....	Covert and Howe.....	1.63	172
Jan. 22.....	B. F. Howe.....	a2.99	531
Feb. 8.....	B. F. Howe.....	a2.01	245
Feb. 24.....	B. F. Howe.....	a1.87	204
Mar. 11.....	B. F. Howe.....	5.89	2,440
June 16.....	Lauterhahn and Howe.....	1.36	112

a Backwater from ice.

Daily discharge, in second-feet, of BEAVER KILL AT COOKS FALLS, for the year ended June 30, 1921

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	320	390	165	3,050	390	3,050	355	150	625	1,200	1,640	248
2.....	260	320	155	1,640	355	3,580	485	1 0	855	1,100	1,240	210
3.....	760	320	136	1,060	2,400	2,160	525	170	1,780	1,010	1,010	198
4.....	625	275	127	805	1,360	1,780	425	140	1,360	905	905	390
5.....	505	260	124	715	955	2,160	425	190	905	715	855	260
6.....	320	235	129	585	760	1,780	425	340	805	715	905	210
7.....	425	222	390	505	715	1,240	290	240	1,780	625	760	198
8.....	290	210	210	465	605	1,060	425	240	4,350	605	625	187
9.....	260	198	165	390	565	955	290	180	4,980	605	565	176
10.....	210	187	355	355	525	855	210	170	3,760	565	485	165
11.....	187	505	390	320	485	805	248	150	2,400	505	425	155
12.....	372	355	620	290	465	670	290	140	1,780	465	408	165
13.....	390	545	805	275	408	625	187	140	2,880	425	390	155
14.....	320	465	585	260	372	3,400	240	130	2,080	390	505	143
15.....	625	390	465	248	760	2,720	900	130	1,920	248	430	134
16.....	372	290	390	235	338	1,500	500	180	1,850	1,010	355	127
17.....	290	275	338	235	760	1,380	280	480	1,500	3,580	320	132
18.....	290	715	290	222	605	1,060	170	300	1,300	1,920	305	136
19.....	305	505	260	222	585	805	240	180	1,060	1,500	290	120
20.....	390	390	235	210	545	715	300	280	1,060	1,120	275	110
21.....	290	320	222	198	525	625	440	260	1,010	1,010	248	107
22.....	260	260	210	187	505	605	550	280	855	805	248	100
23.....	1,010	260	198	176	4,650	955	500	220	715	1,240	235	115
24.....	4,870	210	187	165	2,080	855	320	200	715	2,000	235	140
25.....	2,560	198	176	165	1,380	585	140	190	2,560	1,430	248	118
26.....	1,920	176	176	165	1,120	425	180	200	2,080	1,120	275	100
27.....	1,240	165	165	210	855	525	190	320	1,700	905	222	99
28.....	905	145	338	905	805	525	200	460	1,360	855	198	94
29.....	625	248	260	505	715	425	240	.....	1,120	805	275	198
30.....	505	210	625	465	715	505	220	.....	955	1,240	445	127
31.....	425	176	.....	408	.....	425	170	.....	1,010	.....	305	.....

NOTE.—Discharge, January 14 to February 28, determined from gage-heights corrected for ice effect from 3 discharge measurements, study of weather records and comparison with record of East Branch of Delaware River at Fish Eddy. Discharge estimated September 12, January 5, April 1-2; no gage-height record.

Monthly discharge of BEAVER KILL AT COOKS FALLS, for the year ended June 30, 1921
 [Drainage area, 236 square miles]

MONTH	DISCHARGE IN SECOND-FEET				RUN-OFF
	Maximum	Minimum	Mean	Per square mile	Depth in inches on drainage area
July.....	4,870	187	714	3.03	3.49
August.....	715	145	304	1.29	1.49
September.....	805	124	296	1.25	1.40
October.....	3,050	165	504	2.14	2.47
November.....	4,550	338	906	3.84	4.28
December.....	3,580	425	1,250	5.30	6.11
January.....	900	140	334	1.42	1.64
February.....	480	130	221	.936	.97
March.....	4,980	625	1,710	7.25	8.36
April.....	3,580	248	1,020	4.32	4.82
May.....	1,640	198	504	2.14	2.47
June.....	390	94	161	.682	.76
The year.....	4,980	94	665	2.82	38.26

SUSQUEHANNA RIVER DRAINAGE BASIN

DESCRIPTION

Susquehanna river rises in Otsego lake, in northern Otsego county, at an elevation of 1,193 feet above tide, and flows in a general southerly direction into Chesapeake bay. Its course is in many places extremely tortuous, crossing the State boundary between New York and Pennsylvania three times. The entire length of the river is about 500 miles and it drains an area of 27,400 square miles, of which 21,060 square miles lie in Pennsylvania, 6,080 in New York and 260 in Maryland.

SUSQUEHANNA RIVER AT CONKLIN

Location.—At steel highway bridge just below Conklin, Broome county, 5 miles below Big Snake creek and 8 miles above Chenango river.

Drainage area.—2,350 square miles.

Records available.—November 13, 1912, to June 30, 1921.

Gage.—Stevens continuous water-stage recorder on left bank just below highway bridge. Recorder inspected by George W. Marvin.

Discharge Measurements.—Made from the bridge or by wading.

Channel and control.—Coarse gravel and boulders; probably permanent.

Extremes of discharge.—Maximum stage during year from water-stage recorder, 13.18 feet at 2 A. M. March 10 (discharge, 27,100 second-feet; minimum stage from water-stage recorder, 2.17 feet from 1 to 2 A. M. June 23 (discharge, 345 second-feet).

1912–1921: Maximum stage recorded, 18.3 feet on the morning of March 28, 1913 (discharge, 52,000 second-feet); minimum stage recorded, 1.32 feet at 8:20 A. M. and 4 P. M. September 16, 1913 (discharge, 106 second-feet).

Ice.—Stage-discharge relation usually affected by ice for a large portion of the period from January to March.

Accuracy.—Stage-discharge relation probably permanent during the year, except as affected by ice. Rating curve well defined between 250 and 55,000 second-feet. Operation of water-stage recorder satisfactory except for periods indicated in footnote to daily discharge table. Daily discharge ascertained by applying mean daily gage height to rating table, except for days when the mean gage height would not give the discharge within 1 per cent, for such days the discharge is the mean of 24 hourly determinations. Records good except for periods of ice effect, for which they are fair.

Coöperation.—Station maintained by the United States Geological Survey in coöperation with the State Engineer and Surveyor.

Discharge measurements of SUSQUEHANNA RIVER AT CONKLIN, during the year ended June 30, 1921

DATE	Made by	Gage height	Discharge
		Feet	Sec.-feet
Oct. 24.....	C. C. Covert.....	3.40	1,200
Jan. 20.....	B. F. Howe.....	a4.22	1,590
Feb. 4.....	B. F. Howe.....	a3.88	1,350
Feb. 21.....	B. F. Howe.....	a4.79	2,340
Mar. 5.....	B. F. Howe.....	8.35	11,200
June 14.....	Otto Lauterhahn.....	2.68	652

a Backwater from ice.

Daily discharge, in second-feet, of SUSQUEHANNA RIVER AT CONKLIN, for the year ended June 30, 1921

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	1,250	1,220	1,750	18,400	1,630	8,310	3,330	1,500	5,550	7,100	6,300	1,090
2.....	1,300	1,650	1,750	20,400	1,460	20,600	3,680	1,500	7,330	8,280	9,240	988
3.....	1,170	1,880	1,750	13,900	2,180	25,200	5,800	1,200	12,700	7,330	7,800	898
4.....	1,020	1,400	1,320	8,380	2,990	17,700	6,170	1,300	18,100	6,170	5,940	866
5.....	954	1,160	1,120	6,170	2,830	13,700	4,950	1,000	11,600	5,380	5,170	979
6.....	914	1,030	1,100	5,500	2,280	15,800	5,500	1,600	7,800	4,640	6,170	962
7.....	866	997	1,330	4,740	2,070	18,400	4,640	2,400	14,100	4,040	5,500	810
8.....	988	1,090	1,330	3,950	1,940	13,700	4,040	2,000	19,400	3,680	4,330	740
9.....	890	914	1,250	3,590	1,880	9,740	3,770	1,800	21,100	3,590	3,590	719
10.....	782	898	1,420	3,240	1,940	7,800	3,330	1,400	25,200	3,590	3,160	670
11.....	740	1,460	2,250	2,830	2,070	6,860	3,160	1,600	18,700	3,500	2,670	649
12.....	928	2,010	6,460	2,670	2,140	6,400	2,910	1,300	12,100	3,080	2,280	649
13.....	1,130	2,990	12,500	2,440	1,940	5,500	2,750	1,300	11,000	2,670	2,140	649
14.....	970	2,910	12,100	2,210	1,810	9,290	2,600	1,100	11,800	2,440	2,140	656
15.....	988	4,530	7,850	2,000	1,690	17,100	3,400	1,800	9,740	2,280	2,070	579
16.....	1,030	4,430	5,500	1,880	1,750	17,100	4,400	1,200	9,240	2,210	1,880	551
17.....	946	6,900	4,740	1,810	4,570	12,600	3,000	4,200	9,000	2,440	1,690	572
18.....	818	6,630	4,140	1,630	6,400	9,000	1,900	9,500	8,280	2,910	1,570	593
19.....	1,040	6,760	3,330	1,570	4,640	7,330	1,600	6,000	7,800	4,230	1,520	551
20.....	1,740	3,780	2,910	1,750	3,950	5,940	1,600	3,200	6,860	4,430	1,290	488
21.....	1,810	2,830	2,670	1,570	3,500	5,170	1,800	2,200	7,330	3,680	1,190	452
22.....	1,600	2,440	2,360	1,340	3,590	4,840	2,600	1,900	8,280	3,330	1,090	422
23.....	1,400	2,280	2,000	1,280	8,900	5,380	3,600	1,800	7,100	4,510	1,050	456
24.....	13,200	2,000	1,750	1,230	15,200	7,330	3,600	1,800	5,940	5,940	970	440
25.....	9,550	1,880	1,630	1,190	12,100	6,400	2,600	1,800	5,940	6,860	1,080	385
26.....	4,630	1,570	1,570	1,210	8,760	4,200	2,800	1,500	6,630	5,380	1,220	375
27.....	3,160	1,350	1,460	1,200	7,330	3,160	2,400	1,400	7,800	4,230	1,350	380
28.....	2,360	1,310	1,750	1,520	6,630	3,860	2,200	2,600	7,100	3,680	1,250	544
29.....	1,880	1,460	3,460	2,530	6,170	3,950	2,000	.....	6,170	3,240	1,170	565
30.....	1,570	1,810	8,110	2,830	5,500	3,590	1,600	.....	5,720	3,240	1,210	518
31.....	1,320	1,940	.....	2,140	.....	3,680	1,600	.....	5,280	.....	1,130	.....

NOTE.—Discharge, January 14 to February 28, determined from gage-heights corrected for ice effect from 3 discharge measurements, study of weather records and comparison with records of flow at other stations in same drainage. Discharge estimated from recorder graph March 16 to 18, no automatic record.

Monthly discharge of SUSQUEHANNA RIVER AT CONKLIN, for the year ended June 30, 1921

[Drainage area, 2,350 square miles]

MONTH	DISCHARGE IN SECOND-FEET				RUN-OFF
	Maximum	Minimum	Mean	Per square mile	Depth in inches on drainage area
July.....	13,200	740	2,030	.864	1.00
August.....	6,900	898	2,440	1.04	1.20
September.....	12,500	1,100	3,420	1.46	1.63
October.....	20,400	1,190	4,100	1.74	2.01
November.....	15,200	1,460	4,330	1.84	2.05
December.....	25,200	3,160	9,670	4.11	4.74
January.....	6,170	1,600	3,200	1.36	1.57
February.....	9,500	1,000	2,190	.932	.97
March.....	25,200	5,280	10,300	4.38	5.05
April.....	8,280	2,210	4,270	1.82	2.03
May.....	9,240	970	2,880	1.23	1.42
June.....	1,090	375	640	.272	.30
The year.....	25,200	375	4,150	1.77	23.97

CHENANGO RIVER NEAR CHENANGO FORKS

Location.—About $1\frac{1}{2}$ miles below Tioughnioga river, 2 miles by road below Chenango Forks postoffice, Broome county, and $11\frac{1}{2}$ miles above Binghamton and the mouth.

Drainage area.—1,420 square miles. See "Diversions."

Records available.—November 11, 1912, to June 30, 1921.

Gage.—Stevens water-stage recorder on the left bank on the farm of Erastus Ingraham except September 18 to June 13, when a Gurley 7-day graph water-stage recorder was in use.

Discharge measurements.—Made from cable about 100 feet above the gage, or by wading.

Channel and control.—Sand, gravel and small cobblestones; practically permanent.

Extremes of discharge.—Maximum stage during year from water-stage recorder, 9.6 feet at 3 A. M. March 10 (discharge, 17,600 second-feet); minimum stage from water-stage recorder, 2.54 feet at 3 A. M. July 12 (discharge, 228 second-feet).

1912-1921: Maximum stage recorded, 13.7 feet on afternoon of March 27, 1913 (discharge, 35,500 second-feet); minimum stage recorded, 2.20 feet several times in August and September, 1913 (discharge, 92 second-feet).

Ice.—Stage-discharge relation affected by ice.

Diversions.—The run-off from 87.3 square miles at head of Chenango river and from 15.7 square miles at head of Tioughnioga river is stored in reservoirs and, except for discharge over the spillways, is diverted out of the drainage area to the Erie

canal. The above mentioned drainage area for Chenango river does not include these two areas.

Accuracy.—Stage-discharge relation practically permanent. The old rating was revised at low stages and new rating used beginning October 1. Rating curve fairly well defined between 200 and 20,000 second-feet. While the Gurley gage was in operation, there were frequent breaks in the record due to the stopping of the clock. Estimates were necessary during these periods. Operation of Stevens water-stage recorder satisfactory. Daily discharge ascertained by applying to the rating table the mean daily gage heights, determined by inspecting gage-height graph or for days of considerable fluctuation, by averaging the discharge for intervals of the day. Records good except for periods of estimates and when stage-discharge relation was affected by ice, for which they are fair.

Coöperation.—Station maintained by the United States Geological Survey in coöperation with the State Engineer and Surveyor.

Discharge measurements of CHENANGO RIVER NEAR CHENANGO FORKS, during the year ended June 30, 1921

DATE	Made by	Gage height	Discharge
		<i>Feet</i>	<i>Sec.-ft.</i>
Jan. 19.....	B. F. Howe.....	a 3.30	874
Feb. 5.....	B. F. Howe.....	a 5.50	1,140
Feb. 7 b.....	B. F. Howe.....	a 6.48	1,800
Feb. 19.....	B. F. Howe.....	a 6.26	1,990
Mar. 2.....	B. F. Howe.....	a 6.12	4,730
Mar. 8.....	B. F. Howe.....	8.17	12,600
Mar. 8.....	B. F. Howe.....	8.22	13,000
June 13.....	Howe and Lauterhahn.....	2.77	401
June 13.....	Howe and Lauterhahn.....	2.78	426

a Back water from ice.

b Measurement made through ice above Forest Street bridge, Binghamton.

Daily discharge, in second-feet, of CHENANGO RIVER NEAR CHENANGO FORKS, for the year ended June 30, 1921

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	375	744	538	7,450	536	4,720	1,600	.....	4,000	4,390	3,640	680
2.....	368	804	564	5,140	780	12,200	2,310	.....	5,500	4,390	3,440	579
3.....	330	546	470	2,960	846	10,400	4,500	.....	10,000	3,850	2,680	536
4.....	297	438	414	2,160	770	7,510	3,240	.....	10,900	3,240	2,240	706
5.....	279	375	352	1,780	696	7,510	2,770	1,200	6,120	2,860	2,260	.....
6.....	261	352	390	1,640	637	8,650	3,140	1,600	5,290	2,500	3,440	.....
7.....	285	315	430	1,390	589	6,820	2,240	1,200	12,200	2,160	2,500	.....
8.....	279	291	430	1,170	545	4,960	2,330	900	13,200	2,000	2,000	.....
9.....	273	303	430	1,090	545	3,640	2,240	650	15,300	2,080	1,700	.....
10.....	255	550	430	1,010	646	3,240	1,840	700	15,300	2,160	1,480	.....

Daily discharge, in second-feet, of CHENANGO RIVER NEAR CHENANGO FORKS, for the year ended June 30, 1921 — *Continued*

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
11.....	242	3,260	700	914	696	2,960	1,690	650	9,850	1,820	1,330	.....
12.....	255	3,400	1,460	824	675	2,590	1,700	700	6,820	1,620	1,170	.....
13.....	297	1,890	4,060	780	579	2,420	1,460	550	9,850	1,480	1,160	409
14.....	285	2,710	2,440	738	510	5,100	1,510	650	8,360	1,390	1,290	396
15.....	297	2,180	1,660	696	502	11,400	2,000	500	6,300	1,320	1,170	375
16.....	315	2,520	1,090	675	493	7,610	2,000	900	6,040	1,330	1,030	348
17.....	309	4,960	1,120	656	1,410	5,080	1,530	1,600	6,040	1,760	938	355
18.....	279	3,700	970	656	2,240	3,960	824	4,600	5,430	2,420	879	368
19.....	422	4,330	750	617	1,720	3,140	1,000	2,200	4,280	2,590	824	348
20.....	456	1,620	650	579	1,570	2,500	1,200	2,000	4,060	2,000	770	336
21.....	504	1,170	584	536	1,660	2,420	1,400	1,600	5,080	1,920	696	336
22.....	446	937	546	502	2,070	2,160	2,000	1,900	4,620	2,160	656	311
23.....	521	816	512	493	7,310	3,050	2,800	1,700	3,640	5,190	656	305
24.....	1,890	690	478	478	9,850	4,060	2,200	1,300	3,240	7,790	.....	329
25.....	985	574	454	431	6,430	2,680	1,100	900	3,440	4,960	.....	323
26.....	710	521	446	439	4,730	2,160	1,200	950	4,170	3,500	.....	280
27.....	538	470	430	470	4,060	2,000	.....	1,000	4,730	3,000	.....	264
28.....	438	422	640	656	3,740	2,000	.....	1,900	3,640	2,700	.....	280
29.....	375	454	805	656	3,540	2,240	.....	.....	3,640	2,600	.....	275
30.....	345	530	1,320	748	3,050	2,000	.....	.....	3,850	3,000	.....	275
31.....	330	478	.....	717	.....	1,690	.....	.....	3,850	.....	.....	.....

NOTE.— Discharge, January 19 to March 3, determined from gage-heights corrected for ice effect from 5 discharge measurements, study of weather records and comparison with record of Susquehanna river at Conklin. Mean daily discharge estimated from comparative hydrographs as follows: January 27 to 31, 950 second-feet; February 1 to 4, 650 second-feet; May 24 to 31, 700 second-feet; June 5 to 12, 500 second-feet; recorder, did not operate. Discharge for following days based on estimated gage-heights: October 13 to 15, 28, 29, November 1 to 5, 13, 14, December 2, 3, March 10, 11, 13, 28 to 31, April 1, 15, 20 to 24, 26 to 30, May 13, 14, 19, June 1, 13. Gage-heights from staff gage used September 6 to 18; no automatic record.

Monthly discharge of CHENANGO RIVER NEAR CHENANGO FORKS, for the year ended
June 30, 1921

[Drainage area, 1,420 square miles]

MONTH	DISCHARGE IN SECOND-FEET				Run-off Depth in inches on drainage area
	Maximum	Minimum	Mean	Per square mile	
July.....	1,890	242	427	.301	.35
August.....	4,960	291	1,370	.965	1.11
September.....	4,060	352	852	.600	.67
October.....	7,450	431	1,260	.887	1.02
November.....	9,850	493	2,110	1.49	1.66
December.....	12,200	1,690	4,610	3.25	3.75
January.....	4,500	824	1,820	1.28	1.48
February.....	4,600	500	1,230	.866	.90
March.....	15,300	3,240	6,730	4.74	5.46
April.....	7,790	1,320	2,810	1.98	2.21
May.....	3,640	656	1,400	.986	1.14
June.....	706	264	414	.292	.33
The year.....	15,300	242	2,100	1.48	20.08

CHEMUNG RIVER

DESCRIPTION

Chemung river is formed at Painted Post by the confluence of Tioga and Cohocton rivers. Cohocton river lies entirely in the State of New York. Tioga river receives, just above its mouth, Canisteo river, a large tributary, which also has its drainage basin in New York to the south of Cohocton. The drainage area of Tioga river, above the Canisteo, is mainly in Pennsylvania. Chemung river flows southeastward through Corning, Elmira and Chemung, crosses the state line and flows for a short distance in Pennsylvania, then returns to New York and crosses again to Pennsylvania near Waverly, finally emptying into the Susquehanna near Athens, Pa. The total length of the river is about 40 miles, of which 30 miles lie in New York. The drainage area, measured at the mouth, is 2,250 square miles.

The topographic features of the basin are, as a rule, bold and broad. The hills rise to a height of several hundred feet on either side, within a short distance of the stream. The upland plateau is to a large extent wooded, has impervious soil, no lake storage and few marsh areas. Tributaries are ramifying and uniformly distributed, though not very numerous, and dry gullies, or flood channels, are common. The main river is sluggish, with low banks and a broad valley, or flood plain, which is often overflowed. The concentration of storm waters from the three large streams, which unite just above Corning, makes possible excessive floods. Dikes have been erected in the cities of Elmira and Corning for protection. One of the highest recorded freshets in the stream occurred June 1, 1889. It was preceded by phenomenal rainfall, aggregating several inches in a few hours during the night of May 31. The discharge at this time has been estimated at 67 second-feet per square mile from 2,055 square miles, or 138,000 second feet.

CHEMUNG RIVER AT CHEMUNG

Location.—At the new highway bridge about midway between Chemung, Chemung county, N. Y., and Willawana, Pa., half a mile upstream from State line and about 10 miles above mouth.

Drainage area.—2,440 square miles.

Records available.—September 11, 1903, to June 30, 1921.

Gage.—Tape gage at the upstream side of the right span of the bridge; read by D. L. Orcutt.

Discharge measurements.—Made from the bridge or by wading.

Channel and control.—Sand and gravel; occasionally shifting.

Extremes of discharge.—Maximum stage recorded during year, 11.55 feet at 11:30 A. M. February 17 (discharge, 26,300 second-

feet); minimum stage recorded, 1.84 feet at 4:30 P. M. July 18 (discharge, 227 second-feet). (Discharge of 189 second-feet at 6 A. M. June 27, corresponding to gage height of 1.86 feet).

1903-1921: Maximum stage recorded, 17.96 feet at 7 A. M. March 15, 1918 (discharge, about 67,000 second-feet); minimum stage recorded, 1.47 feet at 7 A. M. August 14, 1911 (discharge, about 49 second-feet).

Ice.—Stage-discharge relation affected by ice.

Regulation.—Power is developed above the station, the largest plant being at Elmira, N. Y.

Accuracy.—Stage-discharge relation changed at time of spring breakup. Rating curve used before this time well defined between 200 and 45,000 second-feet; definition of subsequent curve about the same. Gage read to hundredths twice daily. Daily discharge ascertained by applying mean daily gage height to rating table. Open-water records good; records for period of ice effect, fair.

Coöperation.—Station maintained by the United States Geological Survey in coöperation with State Engineer and Surveyor.

Discharge measurements of CHEMUNG RIVER AT CHEMUNG, during the year ended June 30, 1921

DATE	Made by	Gage height	Discharge
		<i>Feet</i>	<i>Sec.-ft.</i>
Jan. 18.....	B. F. Howe.....	a 2.84	324
Feb. 3.....	B. F. Howe.....	a 2.78	594
Feb. 18.....	B. F. Howe.....	6.62	7,370
Mar. 3.....	B. F. Howe.....	8.44	13,400
Mar. 4.....	B. F. Howe.....	6.92	8,410
June 10.....	Howe and Lauterhahn.....	2.24	409
June 11.....	Howe and Lauterhahn.....	2.21	391

a Backwater from ice.

Daily discharge, in second-feet, of CHEMUNG RIVER AT CHEMUNG, for the year ended June 30, 1921

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	332	830	438	5,760	444	3,100	870	500	6,720	4,220	2,910	995
2.....	288	710	389	4,240	407	13,100	1,250	500	5,280	5,060	4,420	905
3.....	630	670	365	2,140	444	9,700	2,600	600	13,100	4,020	3,440	740
4.....	343	588	338	1,480	484	6,000	2,140	600	11,000	3,260	2,740	620
5.....	310	546	326	1,150	567	4,650	1,730	550	5,060	2,740	3,080	550
6.....	277	504	326	1,000	504	4,240	1,730	800	3,820	2,280	5,280	511
7.....	266	464	343	870	458	3,460	1,420	850	11,700	1,410	3,440	466
7.....	277	484	326	750	432	2,930	1,360	700	12,700	1,720	2,580	433
8.....	246	670	354	670	425	2,290	1,480	650	16,000	1,590	2,130	408
10.....	299	609	365	602	401	1,860	1,300	650	16,400	1,850	1,720	384

GAGING OF STREAMS: SUSQUEHANNA RIVER BASIN 229

Daily discharge, in second-feet, of CHEMUNG RIVER AT CHEMUNG, for the year ended
June 30, 1921 — *Continued*

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
11.....	288	1,200	354	532	401	1,730	1,100	600	9,350	1,590	1,410	366
12.....	299	1,420	870	518	383	1,600	950	600	6,470	1,410	1,190	384
13.....	282	1,000	1,600	490	389	1,480	750	500	13,400	1,300	1,140	384
14.....	277	1,000	1,730	477	377	1,730	600	600	10,300	1,190	1,140	420
15.....	266	870	1,050	458	348	6,490	750	585	7,250	1,090	1,090	366
16.....	236	1,000	790	432	360	3,460	650	620	5,980	1,090	950	336
17.....	241	1,360	616	407	790	2,600	500	26,600	5,060	1,140	860	312
18.....	227	7,850	525	389	1,540	2,000	320	8,110	4,220	1,590	780	306
19.....	438	3,650	458	383	1,730	1,730	500	3,440	3,440	1,590	740	295
20.....	407	2,140	401	371	1,730	1,420	750	2,740	3,260	1,410	700	285
21.....	630	1,540	371	365	2,000	1,300	750	1,850	3,820	1,240	620	260
22.....	470	1,200	354	354	2,930	1,150	950	1,590	3,440	1,190	585	250
23.....	616	1,000	343	332	5,300	1,420	1,300	1,470	2,910	2,910	585	241
24.....	13,500	870	332	321	7,560	2,290	1,400	1,350	2,430	14,200	620	232
25.....	15,300	750	299	321	4,860	1,860	750	950	2,430	6,720	780	214
26.....	4,440	670	310	321	4,040	1,360	600	820	3,080	4,420	780	214
27.....	2,600	560	299	321	3,460	1,000	600	995	3,440	3,260	995	189
28.....	1,730	546	389	321	3,100	1,360	750	1,190	2,740	2,580	820	223
29.....	1,360	504	518	389	3,100	1,250	750	.....	4,020	2,130	740	232
30.....	1,050	490	616	438	2,760	1,050	650	.....	3,260	2,280	1,590	270
31.....	870	464	.....	490	.....	1,150	550	.....	2,910	.....	1,240	.....

NOTE.—Discharge, January 12 to February 14, determined from gage-heights corrected for ice effect from two discharge measurements, study of weather records and comparison with records of Tioga and Cohocton rivers.

Monthly discharge of CHEMUNG RIVER AT CHEMUNG, for the year ended June 30, 1921
[Drainage area, 2,440 square miles]

MONTH	DISCHARGE IN SECOND-FEET				RUN-OFF Depth in inches on drainage area
	Maximum	Minimum	Mean	Per square mile	
July.....	15,300	227	1,580	.648	.75
August.....	7,850	464	1,170	.480	.55
September.....	1,730	299	526	.216	.24
October.....	5,760	321	874	.358	.41
November.....	7,560	348	1,720	.705	.79
December.....	13,100	1,000	2,930	1.20	1.38
January.....	2,600	320	1,030	.422	.49
February.....	26,600	500	2,180	.893	.93
March.....	16,400	2,430	6,610	2.71	3.12
April.....	14,200	1,090	2,750	1.13	1.26
May.....	5,280	585	1,650	.676	.78
June.....	995	189	393	.161	.18
The year.....	26,600	189	1,950	.799	10.88

TIOGA RIVER NEAR ERWINS

Location.—At highway bridge one-quarter mile below the mouth of the Canisteo river near the village of Erwins, Steuben county, and about 3 miles above the junction of the Tioga and Cohocton rivers, which form the Chemung river at the town of Painted Post.

Drainage area.—1,320 square miles (furnished by Robert O. Hayt).

Records available.—July 12, 1918, to June 30, 1921.

Gage.—Chain near left abutment, downstream side of bridge; read by Loren King.

Discharge measurements.—Made from bridge or by wading.

Channel and control.—Bed composed of well compacted gravel; probably permanent.

Extremes of discharge.—Maximum stage recorded during year, 12.45 feet at 4:20 P. M. July 24 (discharge, about 26,000 second-feet); minimum stage recorded, 0.90 foot at 4:30 P. M. July 18 (discharge, 50 second-feet).

1918–1921: Maximum stage recorded, 16.4 feet at 4 P. M. May 22, 1919 (beyond the limits of present rating curve); minimum stage recorded that of July 18, 1920.

Ice.—Stage-discharge relation affected by ice.

Regulation.—Storage not sufficient to affect the seasonal flow.

Accuracy.—Stage-discharge relation practically permanent during the year, except as affected by ice. Rating curve fairly well defined from 100 to 200 second-feet and well defined from 200 to 13,000 second-feet; extended beyond these limits. Gage read to quarter-tenths twice daily. Discharge ascertained by applying mean daily gage height to rating table. Open-water records good; records for periods of ice effect and when gage was not read, fair.

Coöperation.—Station established by the Lamoka Power Company under the direction of the United States Geological Survey. Maintained by the Survey in coöperation with the Power Company and the State Engineer and Surveyor.

Discharge measurements of TIOGA RIVER NEAR ERWINS, during the year ended June 30, 1921

DATE	Made by	Gage height	Discharge
		<i>Feet</i>	<i>Sec.-ft.</i>
Jan. 28.....	Otto Lauterhahn.....	a 1.88	219
Feb. 6.....	Otto Lauterhahn.....	a 2.06	452
Feb. 25.....	Otto Lauterhahn.....	a 1.76	299
Feb. 25.....	Otto Lauterhahn.....	a 1.72	297
June 10.....	Lauterhahn and Howe.....	1.35	200

a Backwater from ice.

GAGING OF STREAMS: SUSQUEHANNA RIVER BASIN 231

Daily discharge, in second-feet, of TIOGA RIVER NEAR ERWINS, for the year ended
June 30, 1921

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	112	348	134	4,090	240	1,840	700	340	3,080	3,240	2,620	590
2.....	109	306	127	1,620	245	5,960	940	340	2,620	2,920	2,770	520
3.....	112	265	109	1,020	240	5,760	1,420	300	7,010	2,210	1,840	390
4.....	88	235	85	625	384	2,480	940	300	4,270	1,620	1,620	372
5.....	100	200	88	520	336	1,840	780	280	2,080	1,420	1,840	354
6.....	73	175	103	450	240	1,840	860	550	1,960	1,240	2,770	276
7.....	60	170	109	366	205	.....	660	500	11,200	1,060	2,080	220
8.....	79	366	134	306	200	.....	700	380	5,370	1,020	1,420	195
9.....	118	250	118	270	190	.....	660	320	7,910	980	1,150	166
10.....	109	235	112	250	195	.....	625	320	7,010	1,100	1,000	230
11.....	103	980	146	200	200	.....	625	320	3,920	980	860	170
12.....	112	660	700	215	166	.....	492	300	3,080	940	740	170
13.....	88	485	2,480	200	146	.....	366	320	6,790	740	740	225
14.....	79	450	820	195	154	1,620	300	260	4,270	660	780	190
15.....	85	478	541	166	158	3,580	260	260	3,240	660	660	154
16.....	68	700	390	142	150	1,730	230	280	3,240	625	548	134
17.....	68	980	255	146	432	1,330	200	13,000	2,620	980	464	124
18.....	56	3,240	220	154	700	1,100	180	2,800	1,960	1,020	432	138
19.....	235	1,240	166	134	780	860	180	1,700	1,620	940	390	146
20.....	444	780	142	134	940	860	150	700	1,620	820	396	130
21.....	220	583	134	130	1,620	780	280	750	2,080	740	312	115
22.....	175	485	112	118	3,080	780	400	800	1,840	700	318	94
23.....	150	396	112	118	2,620	900	700	750	1,420	1,060	306	76
24.....	19,500	336	97	112	3,410	1,520	700	650	1,380	8,380	527	94
25.....	4,990	294	100	118	2,080	860	320	480	1,620	2,920	420	82
26.....	1,730	235	112	112	1,960	760	220	600	1,790	2,080	860	62
27.....	1,100	175	103	121	1,620	660	170	700	1,960	1,620	625	118
28.....	820	200	142	115	1,620	780	190	1,520	1,520	1,330	464	124
29.....	569	175	190	205	1,420	660	190	.....	2,620	1,240	372	154
30.....	478	158	600	240	1,420	625	240	.....	2,080	1,960	1,100	200
31.....	366	146	.....	240	.....	700	300	.....	1,730	.....	740	.....

NOTE.—Discharge, January 14 to February 26, determined from gage-heights corrected for ice effect from four discharge measurements, study of weather records and comparison with Chemung and Cohocton records. Mean daily discharge, December 7 to 13 estimated at 1,200 second-feet from comparative hydrographs; discharge estimated by interpolation and otherwise September 30, October 31, November 1, December 26, March 26, May 10; gage-heights missing.

Monthly discharge of TIOGA RIVER NEAR ERWINS, for the year ended June 30, 1921
[Drainage area 1,320 square miles]

MONTH	DISCHARGE IN SECOND-FEET				RUN-OFF Depth in inches on drainage area
	Maximum	Minimum	Mean	Per square mile	
July.....	19,500	56	1,040	.788	.91
August.....	3,240	146	507	.384	.44
September.....	2,480	85	290	.218	.24
October.....	4,090	112	414	.314	.36
November.....	3,410	146	905	.686	.77
December.....	5,960	625	1,560	1.18	1.36
January.....	1,420	150	483	.366	.42
February.....	13,000	260	1,060	.803	.84
March.....	11,200	1,380	3,380	2.56	2.95
April.....	8,380	625	1,570	1.19	1.33
May.....	2,770	306	1,010	.765	.88
June.....	590	62	200	.152	.17
The year.....	19,500	56	1,040	.788	10.67

COHOCTON RIVER NEAR CAMPBELL

Location.—At the highway bridge, known locally as Red bridge, nearly two miles upstream from the town of Campbell, Steuben county, and about midway between Campbell and Savona.

Drainage area.—480 square miles (furnished by Mr. Robert O. Hayt).

Records available.—July 11, 1918, to June 30, 1921.

Gage.—Chain gage secured to the downstream handrail of the bridge near the left abutment; read by Miss Dora Wood.

Discharge measurements.—Made from bridge or by wading.

Channel and control.—Firmly bedded gravel, not likely to shift.

Extremes of discharge.—Maximum stage recorded during year, 4.48 feet at 8 A. M. February 17 (discharge, 3,290 second-feet); minimum stage recorded, 0.68 foot at 7:30 P. M. July 5 and 8:30 A. M. July 6 (backwater correction of 0.07 foot due to aquatic growth); (discharge, about 49 second-feet).

1918–1921: Maximum stage recorded, 8.62 feet at noon March 12, 1920, during spring break-up (indicated discharge, 11,300 second-feet); minimum stage recorded, 0.68 foot at 6 P. M. September 30, 1919 (discharge, 28 second-feet).

Ice.—Stage-discharge relation affected by ice.

Regulation.—Seasonal distribution of flow is probably not affected by small reservoirs above.

Accuracy.—Stage-discharge relation practically permanent above gage height 1.50 feet. Rating curve well defined from 350 to 6,500 second-feet. Backwater effect in summer months due to aquatic growth in channel. Gage read to quarter-tenths twice daily. Daily discharge ascertained by applying mean daily gage-heights, corrected for backwater effect as determined by discharge measurements, to rating table. Records fair.

Coöperation.—Station established by the United States Geological Survey in coöperation with the Lamoka Electric Power Corporation and maintained by the Survey in coöperation with the State Engineer and Surveyor.

Discharge measurements of COHOCTON RIVER NEAR CAMPBELL, during the year ended June 30, 1921

DATE	Made by	Gage height	Discharge
		Feet	Sec.-feet
July 14.....	Otto Lauterhahn.....	0.71	48.4
July 14.....	Otto Lauterhahn.....	.70	51.8
Aug. 26.....	Lauterhahn and Covert.....	1.00	128
Aug. 26.....	Lauterhahn and Covert.....	1.00	111
Sept. 24.....	Lauterhahn and Lamoureux.....	.755	58.6
Oct. 13.....	Covert and Lauterhahn.....	.89	97.2
Jan. 27.....	Otto Lauterhahn.....	α 2.25	309
Feb. 5.....	Otto Lauterhahn.....	α 1.74	162
Feb. 25.....	Otto Lauterhahn.....	1.25	246
Feb. 25.....	Otto Lauterhahn.....	1.31	279
June 9.....	Otto Lauterhahn.....	.91	86.9

α Backwater from ice.

GAGING OF STREAMS: SUSQUEHANNA RIVER BASIN 233

Daily discharge, in second-feet, of COHOCTON RIVER NEAR CAMPBELL, for the year ended June 30, 1921

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	68	164	82	595	87	581	517	150	800	650	481	193
2.....	73	117	73	360	94	1,920	517	110	800	517	543	168
3.....	64	106	58	241	135	1,400	549	130	1,860	457	424	141
4.....	55	99	71	193	126	1,130	457	140	1,220	402	392	109
5.....	53	84	68	171	120	955	457	160	955	345	446	104
6.....	51	84	71	158	123	875	457	160	1,130	316	446	89
7.....	55	99	71	123	102	800	350	150	2,640	316	338	89
8.....	64	105	78	107	106	688	487	130	2,150	312	307	94
9.....	73	92	68	99	117	517	378	180	2,390	340	262	94
10.....	62	82	73	92	102	457	378	170	1,920	312	220	80
11.....	58	228	71	89	94	376	402	160	1,500	266	201	84
12.....	60	147	151	94	89	321	345	150	1,310	253	208	112
13.....	62	158	164	94	104	307	249	140	2,030	228	189	117
14.....	55	178	120	96	138	616	260	120	1,500	224	168	102
15.....	82	186	100	87	102	581	160	100	1,310	232	158	106
16.....	62	257	89	75	102	457	140	240	1,130	216	151	106
17.....	51	336	75	82	151	376	60	2,900	915	266	135	94
18.....	53	815	64	75	186	307	65	875	838	302	126	92
19.....	117	499	62	80	193	307	70	800	725	336	123	89
20.....	94	386	78	80	232	331	90	420	650	249	117	92
21.....	66	266	62	71	284	350	130	457	616	288	117	104
22.....	71	228	58	75	650	376	160	581	549	266	120	109
23.....	106	186	55	82	955	331	280	293	487	616	161	96
24.....	2,930	144	58	71	1,040	402	240	275	457	1,220	147	87
25.....	740	132	51	75	838	350	200	249	430	875	141	87
26.....	499	114	55	80	650	350	280	208	402	688	147	99
27.....	386	106	58	92	616	487	300	193	376	549	129	96
28.....	270	89	129	141	549	331	240	650	340	430	141	109
29.....	205	92	104	141	517	326	220	.....	430	402	253	138
30.....	164	96	132	109	457	307	150	.....	402	430	212	168
31.....	109	82	.....	96	.....	149	180	.....	402	.....	158	.....

NOTE.—Discharge, Jan. 14–Feb. 16, determined from gage-heights corrected for ice effect from 2 discharge measurements, study of weather records, and comparison with Chemung and Tioga records. Discharge estimated Sept. 14, 15, Feb. 20, 24, 25; no gage-heights record. Backwater effect from aquatic growth July 1–Nov. 10, and May 1–June 30.

Monthly discharge of COHOCTON RIVER NEAR CAMPBELL, for the year ended June 30, 1921

[Drainage area, 480 square miles]

MONTH	DISCHARGE IN SECOND-FEET				RUN-OFF Depth in inches on drainage area
	Maximum	Minimum	Mean	Per square mile	
July.....	2,930	51	221.0	.460	.53
August.....	815	82	186	.388	.45
September.....	164	51	81.6	.170	.19
October.....	595	71	130	.271	.31
November.....	1,040	87	302	.629	.70
December.....	1,920	149	550	1.15	1.33
January.....	549	60	283	.590	.68
February.....	2,900	100	368	.767	.80
March.....	2,640	340	1,050	2.19	2.52
April.....	1,220	216	410	.854	.95
May.....	543	117	231	.481	.55
June.....	193	80	108	.225	.25
The year.....	2,930	51	328	.683	9.26

ALLEGHENY RIVER DRAINAGE BASIN**ALLEGHENY RIVER****DESCRIPTION**

Allegheny river drains the western slopes of the Allegheny mountains in Pennsylvania and New York.

The river rises in the central part of Potter county, in northern Pennsylvania, flows in a general northwesterly direction into New York to about the central part of Cattaraugus county, where it turns and flows southwestward back into Pennsylvania.

The mean annual rainfall in this region is about 40 inches and the winters are severe. Snowfall is heavy in the upper part of the basin and lasts for long periods, and ice forms to a thickness of about 2 feet. The heavy ice during the spring floods is very destructive. Jams frequently occur, which cause considerable damage from backwater.

Allegheny river is subject to very severe floods, which cause heavy losses to manufacturing and other interests along the river.

ALLEGHENY RIVER AT RED HOUSE

Location.—At highway bridge in Red House, Cattaraugus county, about 5 miles below Salamanca and 13 miles above the boundary between New York and Pennsylvania. Conewango creek, the outlet of Chautauqua lake, enters the Allegheny in Pennsylvania about 30 miles below the station.

Drainage area.—1,640 square miles.

Records available.—September 4, 1903, to June 30, 1921.

Gage.—Gurley seven-day graph water-stage recorder on left bank just below the highway bridge, installed September 3, 1917. Prior to this date, chain gage attached to the upstream side of bridge near left end. Recorder inspected by W. E. Coe.

Discharge measurements.—Made from downstream side of bridge and by wading.

Channel and control.—Coarse gravel, occasionally shifting. Current good for medium and high stages, slow at low stages.

Extremes of discharge.—Maximum stage recorded during year, 8.45 feet at 4 p. m. March 7 (discharge, 13,500 second-feet); minimum stage recorded, 3.10 feet on September 26, 27, 28, October 22 and 23 (discharge, 260 second-feet).

1903–1921: Maximum stage recorded, 12.7 feet March 26, 1913 (discharge, 40,000 second-feet); minimum stage recorded, 2.7 feet several days in December, 1908 (discharge, about 100 second-feet).

Ice.—Stage-discharge relation usually affected by ice.

Regulation.—Low water flow may be slightly affected by the operation of several small power plants above Salamanca. A storage reservoir on the divide between Oil creek, tributary to Allegheny river, and Genesee river, tributary to Lake Ontario, was formerly used for supplying water to the Erie canal system through the abandoned Genesee River canal and the Genesee river. This reservoir is no longer used for canal purposes. Water is all turned into Allegheny river through Olean creek.

Accuracy.—Stage-discharge relation changed at the time of Spring break-up. Rating curve used before this time well defined between 300 and 900 second-feet and between 6,000 and 15,000 second-feet; after the spring break-up, rating curve fairly well defined between 200 and 10,000 second-feet. Operation of water-stage recorder generally satisfactory. Daily gage height determined by inspection of hydrograph record. Daily discharge ascertained by applying mean daily gage heights to rating table. Results good.

Coöperation.—Station maintained by the United States Geological Survey in coöperation with the State Engineer and Surveyor.

Discharge measurements of ALLEGHENY RIVER AT RED HOUSE, during the year ended June 30, 1921

DATE	Made by	Gage height	Discharge
		<i>Feet</i>	<i>Sec.-feet</i>
Oct. 3.....	Otto Lauterhahn.....	4.17	1,390
Oct. 28.....	Otto Lauterhahn.....	3.20	339
Oct. 28.....	Otto Lauterhahn.....	3.20	343
Jan. 30.....	Otto Lauterhahn.....	4.26	1,620
June 7.....	B. F. Howe.....	3.75	966
June 7.....	Lauterhahn and Howe.....	3.74	926

Daily discharge, in second-feet, of ALLEGHENY RIVER AT RED HOUSE, for the year ended June 30, 1921

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	905	615	472	1,690	445	2,600	1,660	1,430	2,090	5,100	4,580	2,060
2.....	665	585	436	2,200	418	4,030	3,610	1,300	2,170	4,960	4,080	1,960
3.....	526	555	400	1,430	472	5,160	4,770	1,280	4,860	4,200	3,720	1,610
4.....	526	490	384	991	605	4,400	3,540	1,140	4,770	3,720	3,350	1,440
5.....	472	436	346	768	695	4,020	3,090	1,240	4,020	3,270	2,970	1,320
6.....	400	400	384	645	595	4,270	3,090	1,490	7,660	2,860	2,720	1,110
7.....	418	384	585	555	508	3,900	2,780	1,610	12,900	2,560	2,390	984
8.....	585	384	565	490	472	3,200	3,200	1,480	12,400	2,340	2,340	860
9.....	801	436	472	454	508	2,660	3,420	1,420	12,000	3,270	2,150	820
10.....	905	427	418	418	705	2,330	2,640	1,560	12,000	4,200	1,880	738
11.....	685	661	384	392	823	2,200	2,310	1,580	9,860	3,600	1,690	716
12.....	565	790	454	384	790	1,970	2,180	1,460	8,340	3,160	1,530	593
13.....	481	625	725	360	715	1,870	1,870	1,400	8,020	2,880	1,480	1,110
14.....	454	818	768	346	615	3,770	1,660	1,280	6,790	2,620	1,520	880
15.....	436	2,080	635	339	625	6,400	1,660	1,250	5,640	2,530	1,480	694
16.....	409	1,840	481	346	695	5,290	1,480	2,140	5,100	2,470	1,290	610
17.....	384	3,030	392	339	881	4,400	1,230	10,600	4,830	3,340	1,180	550
18.....	368	4,770	360	318	978	3,780	1,020	9,160	4,580	4,200	1,080	570
19.....	590	3,310	311	311	1,070	3,200	1,160	5,830	4,080	3,380	1,020	590
20.....	1,310	2,200	304	290	1,190	2,680	1,160	4,270	4,200	2,780	945	541
21.....	917	1,630	290	278	1,980	2,180	1,340	3,090	5,100	2,540	893	478
22.....	801	1,360	290	266	6,590	2,060	2,940	2,680	4,960	2,560	944	444
23.....	917	1,160	272	.....	9,250	3,220	3,780	2,460	4,450	2,740	2,120	420
24.....	2,540	991	260	.....	8,900	4,020	3,090	2,090	3,960	4,580	2,900	444
25.....	3,570	834	266	.....	7,140	2,880	1,980	1,740	3,960	4,080	2,430	436
26.....	1,960	725	260	.....	5,830	2,160	1,550	1,540	4,080	3,490	2,510	396
27.....	1,370	655	260	.....	4,640	2,020	1,540	1,690	3,840	3,490	1,960	366
28.....	1,040	499	260	.....	3,900	1,990	1,550	1,940	4,450	3,270	1,700	844
29.....	845	535	311	.....	3,200	1,580	1,500	.....	5,360	3,960	3,490	1,780
30.....	695	535	408	.....	2,820	1,610	1,560	.....	4,580	5,360	3,270	2,300
31.....	665	526	.....	481	.....	1,770	1,380	.....	4,080	.....	2,470	.....

NOTE.—Mean daily discharge October 23 to 29, estimated at 340 second-feet by comparison with Cattaraugus Creek record; no gage-height record. Discharge estimated from estimated gage-heights July 18, August 8, 18 to 20, October 12 to 15, 31.

Monthly discharge, of ALLEGHENY RIVER AT RED HOUSE, for the year ended June 30, 1921

[Drainage area, 1,640 square miles]

MONTH	DISCHARGE IN SECOND-FEET				RUN-OFF Depth in inches on drainage area
	Maximum	Minimum	Mean	Per square mile	
July.....	3,570	368	878	.535	.62
August.....	4,770	384	1,110	.677	.78
September.....	768	260	405	.247	.28
October.....	2,200	266	548	.334	.39
November.....	9,250	418	2,270	1.38	1.54
December.....	6,400	1,580	3,150	1.92	2.21
January.....	4,770	1,020	2,250	1.37	1.58
February.....	10,600	1,140	2,510	1.53	1.59
March.....	12,900	2,090	5,970	3.64	4.20
April.....	5,360	2,340	3,450	2.10	2.34
May.....	4,580	844	2,190	1.34	1.54
June.....	2,300	366	933	.569	.63
The year.....	12,900	260	2,140	1.30	17.70

PRECIPITATION DATA

On the following pages are published certain records of precipitation at stations lying in the Barge canal zone and in the Catskill mountains. The publications of the United States Weather Bureau should be consulted for more complete information on precipitation throughout the State. The following records are grouped under two general headings: (1) those lying in the St. Lawrence River basin and (2) those in the Hudson River basin.

ST. LAWRENCE RIVER DRAINAGE BASIN

LITTLE TONAWANDA CREEK WATERSHED

Daily precipitation, in inches, at LINDEN, for the year ended June 30, 1921

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.				1.78	.40	.09		.01				
2.				.64	.32	.35	.19					
3.	.15	.05		.08	.13			*.03	.25			
4.	.12			.03				*.06	.04			
5.						.08		.03				
6.			.60			.15	*.23	*.76	.38			
7.	.19		.20						.38			
8.	.16		.02				.06	*.13	.28			
9.	.02				.13			.06				
10.		1.57	.15		.03				.32			
11.		.03	.01			.15		*.40				
12.	.01	T	1.12	.46	*.07		*.02	*.24				
13.					*.07		*.01	*.05	.06			.19
14.		.10				.04						
15.						.13	*.14					
16.			.16			*.40	*.32		.28			
17.		.51		T	*.149	*.12	*.07	.05				.14
18.	.03				*.38	*.05		.02	.25			.19
19.	2.06					.03						
20.	.01					.07		*.02	.45			
21.			.08						.03			
22.		.23			.11		.08					
23.		.01			.14	.12		*.13				
24.	2.37				.30		*.02	*.06				
25.	.09		.04		*.22	*.16	*.02		.11			
26.				.05	*.03	.02		*.07	.02			
27.		.45		.25		*.22		*.29				
28.			.11	.06	.05	*.04			.30			.32
29.	.05	.01	.08	.08		*.07			.34			1.62
30.		.02	.23	.08			.20					.01
31.	.04	.06					*.08					
Total...	5.30	3.04	2.80	3.55	3.87	2.29	1.44	2.41	3.49			2.47

T trace. * Snow. No record for April and May.

CLYDE RIVER WATERSHED

Daily precipitation, in inches, at CLYDE, for the year ended June 30, 1921

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....			.29	1.49	.38	.10			.40	.30	.33	.67
2.....						1.60			.10		.02	
3.....	.18											
4.....				.07								.05
5.....				.12		.27		.03				
6.....			.42			*.06	.11	.36				
7.....	.11		.02			*.10			.40			
8.....	.48		.06		T		.03	*.13	.47			
9.....					.18			.20	.23	.31		
10.....	.65	.72	.40									
11.....		.15				*.08		*.29				
12.....	.37		1.21	.05								.41
13.....			.04		*.04				.24		.12	.05
14.....	.45	.07				.28		*.01			.01	
15.....		.01					.02			.03		
16.....			.15				*.11		.38			
17.....		.01		.39	1.04					.93		.34
18.....					*.29	*.02				.07		.19
19.....	2.54									.01		
20.....					.04				.55			
21.....			.02				.06		.02	.18		
22.....	.05	.12			.26	.07				.36		
23.....					.88	.27		.04		.60	.47	.37
24.....	1.48				.09		*.09			.29		
25.....					*.26	*.09			.09		.50	
26.....				.07				.05	.07			
27.....				.22		*.57		*.26				
28.....			.63	.09	.06	*.02		.10			.50	.06
29.....		.10		.11		*.01			*.08		.35	.30
30.....		.07	.72	.12			.11			.56		.71
31.....	1.41	.10				*.01	.08		.06			
Total...	7.72	1.35	3.96	2.73	3.50	3.55	.61	1.47	3.09	3.64	2.30	3.15

T Trace. * Snow.

Daily precipitation, in inches, at MAYS POINT, for the year ended June 30, 1921

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....				.02	.08	1.51	.06		T		.11	
2.....	.22				.25			*T	.04		T	
3.....	.03			.04				*T	*.01			.48
4.....				.07		.27						
5.....			.40	.01		T	.11	.28	.35			
6.....	.03		.92			.15			.48			
7.....	.27				.04	*T	.14	*.13	.31			
8.....					.06			.14	.07	.35		
9.....	.35	.17	.54		.05				.26	.03		
10.....		.23	T		*.03	*.06		*.22				.08
11.....	.26	.38	1.32	.08				*.10			.04	.32
12.....	.02		.02		*.02			*T	.30		.15	.04
13.....	.05	.03	.02			.08	.04		T			
14.....	.16	.08				.20	.12	*.04	T	.05		
15.....			.03			*T	*.06		.33	T		
16.....		.06	.04	.58	*.65	*T	*T	.03		.53		.10
17.....				.02	*.77	*.02	*.02	*.02	.18	.18		.39
18.....	2.55					T	*T			.05		
19.....	.05				.05	T	.02	*T	.62			
20.....			.03		.06	T	T		.06	.18		

Daily precipitation, in inches, at MAYS POINT, for the year ended June 30, 1921—
Continued

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
21.....	.10	.12			.31		T			.39		
22.....					.79	.26		*.02		.04	.37	.51
23.....	.76				.22		*.03	*T	.23	.56	.11	
24.....					*.23	*.03	*.02	*T			.49	
25.....				.03				*.03	.11		.06	
26.....				.01		*.20		*.22				
27.....			.38	.22	.02	*.02		.08	.22		.04	
28.....		.16		T				.05	.18		.57	.32
29.....	.08	.07	.32	.10		*.03	.15			.57	T	.58
30.....	T	.40	1.34	.04	.05		*T		.37	.23	1.01	
31.....		.46		.24								
Total...	5.42	1.76	5.36	1.46	3.68	2.83	.77	1.36	4.12	3.16	2.95	2.82

T Trace. * Snow.

GANARGUA CREEK WATERSHED

Daily precipitation, in inches, at LOCK 30, MACEDON, for the year ended June 30, 1921

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....		.30	.40	1.35	.35	.45	.01		.02	.26	.24	T
2.....				.01	.14	.90	.06		.05			
3.....	.52				.15							
4.....	.05			.05					*T			.10
5.....								.50				
6.....	.10		.30			.10	.07		.40			
7.....	.75					.04			.35			
8.....		.03	.03				.01	*.17	.25			
9.....	.02				.18			.30		.35		
10.....		.35	.05		.01				.25			
11.....		.25	.03					*.71				.04
12.....	.07		1.05	.12			*T	*.20				
13.....							*T		.10		.14	.17
14.....	.05	.02				.40	*T	T			.13	
15.....	.40	.05					*T			.40		
16.....			.16				*.07		.16			
17.....		.05		.20	*.90		*T	.06		.64		.43
18.....					*.35		*T			.30		.23
19.....	2.00							*T	*T			
20.....					.06				.40			
21.....			.03							.13		
22.....	.04	.25			.20	.50				.44		
23.....					.40	.20	*T	T			.20	.74
24.....	.22				.40		*T	*T		.85		
25.....						*.50	*T				.23	
26.....				.08				*T			.02	
27.....			.02	.17		*.40		*.45				
28.....			.25	.12		*.04		T			.29	
29.....									*T	.60	.19	.37
30.....			.40	.10			.20					.20
31.....						.02						
Total...	4.22	1.30	2.72	2.20	3.14	3.55	0.42	2.39	2.58	3.37	1.44	2.28

* Snow. T means trace.

Daily precipitation, in inches, at NEWARK, for the year ended June 30, 1921

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....		1.07		1.78	.34	.01					.23	
2.....	.13			.01	.19	1.37	.05				.13	
3.....					.20			*T	.09			
4.....				.07					*.02			.11
5.....						.12						
6.....			.35				.09	.44	.32			
7.....	.06					.06			.35			
8.....	.58	.08					.11	*.16	.24			
9.....					.17			.13	T	.18		
10.....	.03	.89	.12		.02			.13	.19			
11.....		.25	.02		*.03	*.07		*.50				.38
12.....	.20	.02	.82	.13	.01			*.16				
13.....					*.01				.18		.03	
14.....	.02	.11				.10	*.01	*.98		.01	.03	
15.....	.36	.05				.08		*.11				
16.....							*.25		.19			
17.....		.05	.08	.25	*1.27		*.01	T		.68		
18.....					.16	*.01	*T		.12	.48		.60
19.....	1.85									.03		
20.....			T				.01		.27			
21.....					.08		T			.10		
22.....	.14	.22			.23					.44		
23.....					.50	.43		*T		.68	.26	.28
24.....	.60				.78		*.09	*T		.34	.02	
25.....					*.25	*.09	*.01		.01		.34	
26.....				.06	*.02	*.03	*T	*.02				
27.....				.16		*.34		*.38				
28.....			.50	.34	.03	*T		.01	.17		.06	.02
29.....		.01		.04					.26		1.15	.53
30.....		.02	.38	.07		*.02	.20			T		
31.....						*.01			.08			
Total...	3.97	2.77	2.27	2.91	4.29	2.74	.83	2.89	2.49	2.94	2.25	1.92

* Snow. T means trace.

SENECA RIVER WATERSHED

Daily precipitation, in inches, at BALDWINVILLE, for the year ended June 30, 1921

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....		1.15			.70	.90	.22				.33	
2.....											.22	
3.....	.40								.15			
4.....												
5.....	.08					.74	*.15	.35				
6.....			.78						.87			
7.....							.10		.45			
8.....										.60		
9.....	1.18		1.00					.30				
10.....	.10	.25			.20							
11.....		.15	1.76					*.65				.22
12.....	.12		.25								.35	.13
13.....	.69	.18							.13			
14.....	.10											
15.....	.20											
16.....				.50	1.50		.45					
17.....						.40			.40	.80		.31
18.....	2.30	.54										
19.....	.06						.10					
20.....									.26			

Daily precipitation, in inches, at BALDWINVILLE, for the year ended June 30, 1921
— Continued

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
21.....										.75		
22.....		.07			.25	1.00					.82	T
23.....					1.10					1.10	.40	
24.....	.34				.05							
25.....						*.44						
26.....	.05											
27.....				.37								
28.....			.90					.54			.55	.38
29.....	.11						.16				.03	.28
30.....		.37	1.43	.25	.72					.31		
31.....		.65									.17	
Total...	5.73	3.36	6.12	1.12	4.52	3.48	1.18	1.84	2.26	3.56	2.87	1.32

* Snow. T means trace.

ONEIDA RIVER WATERSHED

Daily precipitation, in inches, at LOCK NO. 22 NEAR NEW LONDON, for the year ended
June 30, 1921

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....					.09	.17	.60				.03	
2.....	.05				.53			*.03	.18			
3.....	.02					.03		*.03	.03			.29
4.....				.20		.22						
5.....					.01	.05	.22					
6.....	.16		.18					.35	.85			
7.....	.27				.03		*.12		.32			
8.....	.10							.17	.13	.12		
9.....	.19	.09	.63		.70				.38			
10.....		.41	.60			.03		*.28		.20		
11.....	.30	.72	.88				*T	*.18				.26
12.....	.25		.25		.05					.03		.11
13.....		.55			*.08	.07	.18	*.14	.33		.12	.03
14.....	.49					.40	.26		.04			
15.....									.41			
16.....			.37	.37	.77		*.04	.10				.04
17.....			.05		.04	*.09			.25	.94		.33
18.....	1.60					*.07				.08		
19.....	.03				.12							
20.....					.10		.07		.90	.23		
21.....					.19		.08			.20		
22.....		.16			.59	*.50				.03		
23.....	.33				.10		*.07			1.09	.18	
24.....					.12	*.08					.42	
25.....				.02					.10		.49	
26.....				.03								
27.....			.90	.17				.43	.08			
28.....		.20	.05						.25		.78	.52
29.....		.08	.18			*.03				.21	.16	
30.....	.22		1.25	.20	.19		.14			.30		
31.....	.80	.55		.50					.40			
Total...	4.81	2.76	5.34	1.49	3.71	1.74	1.78	1.71	4.65	3.43	2.18	1.58

* Snow. T means trace.

BLACK RIVER WATERSHED

Daily precipitation, in inches, at BOONVILLE, for the year ended June 30, 1921

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.		.23		1.07	.54						.19	.41
2.						1.18	.83		.39			
3.	.33				1.17							.12
4.								*.17				
5.	.11				.33	.47						
6.			.20				*.13	*.29	.98			
7.			.15									
8.	1.31				.57			*.19	.41			
9.	T		.56		.43			.15		.38		
10.		.11							.54			
11.		.49						*.50				.39
12.	.36		.73		*.19			*.22				1.20
13.	.59	.57	.81						.36		.29	.18
14.	.59				*.21	2.43	1.13					
15.		.15							.11	.82		
16.			.29	.15					.39			
17.					.74	*.21	*.28	.49		.74		
18.									.11	.12		
19.	1.77					*.35						
20.									.39			
21.					*.47				.27			
22.		.26								.29		
23.						.78	*.15		1.57	.16	.23	
24.	.23				*1.87					.17		
25.											.89	
26.								*.19	.18			
27.				.89								
28.			1.53	.23		*.60		.59	.58		.14	.17
29.		.43								.06	.33	.76
30.	.21	.23	.73				*.19			.32		.11
31.	.09	.21				*.13			.72			
Total...	5.59	2.68	5.00	2.34	6.52	6.15	2.71	2.88	6.94	3.06	2.07	3.34

T=Trace. * Snow.

WOOD CREEK WATERSHED

Daily precipitation, in inches, at SMITH'S BASIN, for the year ended June 30, 1921

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.		1.31	0.05	2.26	0.32	0.55			.03	.70	.30	
2.			0.03		0.03	0.24	.12					
3.	1.04				0.73							.50
4.	0.05				0.01							
5.	0.02			0.34		0.78		.50				
6.			0.10	0.06		0.37					.03	.06
7.			0.29					*.10	.41			
8.	0.09		0.10		0.13		*.26	*.10	T	.05		
9.					0.16				.51	.08		
10.		0.58	0.26		0.09							
11.		0.67	0.18			*0.10						.31
12.	0.36	0.27	0.10	0.08								.33
13.	0.68		0.16						.21		.13	
14.						0.67	*.27					
15.	0.51	0.40				2.32	.54		.05	.37		
16.									.10	.10		
17.			0.16		0.81		*.02		T	.22		
18.					0.12					.48		
19.	0.76								T			
20.							*.05	*.08	.32			

Daily precipitation, in inches, at SMITH'S BASIN, for the year ended June 30, 1921 —
Continued

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
21.....					*0.17			*.01		.11		
22.....					*0.56					.03	.32	
23.....	0.12	0.49			1.05	0.77			T	.16		
24.....	0.16				0.42		*.06			.04		
25.....	0.02				*0.02				1.19		.35	
26.....				0.11					.12			.42
27.....				0.01		*0.82		*.12	.18			.13
28.....			0.47	1.03	*0.05	*0.08		.23			.02	.90
29.....		0.17	0.11	0.02		*0.08			.22		.09	.85
30.....	0.08	0.02	0.95	*0.05			*.06			.45		
31.....		0.12				*0.03					.02	
Total...	3.89	4.03	2.96	3.96	4.67	6.73	1.38	1.14	3.74	2.79	1.26	3.50

* Snow.

Daily precipitation, in inches, at WHITEHALL, for the year ended June 30, 1921

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	1.04	.32	.12	3.87	.26	.06			.05	.35	.22	.15
2.....			T	T	.08	1.17	.45					
3.....	.74				.58			*T	T	.04		
4.....	.27											.04
5.....	.01			.11		.40						
6.....	T			.02	T	.60	T	.38	.10			
7.....	T		.22			*T	*T		.46			.03
8.....	.07		.25		.07		*.17	*.09	.31			
9.....					T		*T			.04		
10.....		.17			.36			*.13	.35	.04	T	
11.....		.31	.35			*.09		*.31				
12.....	.04		.06	.04				*.28				.22
13.....	.22		.14		*T		*.01		.09	T	.22	.19
14.....	.04	T	T			.56	*.03	*.09			.15	.02
15.....	.33	1.34				1.85	.73	*.01	.20	.28		
16.....			T			*T			.15	.23	.04	
17.....			.10		*.80	*T	*.02			.21		
18.....					.18	*T		*T	T	.50		
19.....	1.04	.17	T							.01		
20.....	.30						*.05	*.05	.29			
21.....					*T		*T	*.11	T	.01		
22.....				.01	*.80	1.85	T			.02		
23.....	.04	.43			.67	T				.08	.02	
24.....	.10				.54	*T	*T	*.04		.08		T
25.....	.01				*.02			*T	1.25			
26.....				T					.05		.42	
27.....				.78		*.60		*.05	.16			.17
28.....			.53	T	*.05			.30				.37
29.....		.05	.05	.02		*T			.27			1.77
30.....	.08	.15	.08	T		*T	*.10			.48		.17
31.....	.05						*.04					
Total...	4.38	2.94	1.90	4.85	4.41	7.18	1.60	1.84	3.73	2.37	1.07	3.13

* Snow. T means trace.

HUDSON RIVER DRAINAGE BASIN

HUDSON RIVER WATERSHED

Daily precipitation, in inches, at GLENS FALLS, for the year ended June 30, 1921

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....		1.62	0.20	1.87		T	.02			.24	.62	
2.....					.02		.18		T			
3.....	0.13				1.12			.15				
4.....	0.36											.42
5.....	0.02			0.10		0.32						
6.....						0.54	T	.12	.15			.15
7.....			0.35						.47			
8.....	0.05				0.07		.17	.10	.40			.15
9.....		0.23						.12	.29	.10		
10.....					0.28							
11.....		0.57	0.42			*0.14		.64				.20
12.....		0.12	0.21									.30
13.....	0.56	0.02	0.32		*T				.24		.27	.34
14.....						0.74	.65	T				
15.....	0.32	0.39				1.58	.20		.07	.52		
16.....												
17.....			0.12		*T0.80		.20	.04		.63		
18.....					0.27					0.04		
19.....	1.02											
20.....							.08	.22	.31			
21.....					*T					.09		
22.....					0.70					.04		
23.....	0.10	0.18			*T0.42	0.90	.05	.08		.22	.35	.05
24.....	0.14				1.35				.02	.12		
25.....									1.11		.42	
26.....								T	.27			.17
27.....								.12				.10
28.....	0.15		0.93	1.17		*0.72		.27	.18			.68
29.....		0.32	0.17						.02		.15	.75
30.....	0.11			0.02			.20			.65		.30
31.....									.28			
Total...	2.96	3.45	2.72	3.16	5.03	4.94	1.75	1.86	3.81	2.65	1.81	3.61

* Snow. T means trace.

Station maintained by the U. S. Weather Bureau in cooperation with the State Engineer.

Daily precipitation, in inches, at SCHUYLERVILLE, for the year ended June 30, 1921

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....		.30	.04	.93	.12	.95	.04		.05		.64	
2.....			T	.04	.83	*.05	.05		.04			
3.....	.56				.10							T
4.....	.03			.06	T		T				T	
5.....				.10		1.22		.39	.05		.02	
6.....			.24	.01		*T	*T		.03			.02
7.....	.11	T	.33	.03	.08		*T	*.11	.47			
8.....					T		*.18		.03			
9.....				T	.28		*T	*.09	.53	.13		
10.....		1.88	.63			.02						
11.....	.17	.32	T		T	*.16		*.91				.95
12.....	1.08	.03	.32	.04					.24			
13.....		.05	.53								.22	.33
14.....	1.12	.15	T	.10		1.40	.36				T	
15.....	.01	T		.01					.14	.20		

Daily precipitation, in inches, at SCHUYLERVILLE, for the year ended June 30, 1921
—Continued

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
16.....			.18	.07	.25					.42		
17.....			T		.63			*T		.37		.01
18.....			.12	T						.24		
19.....	1.05	T							.38			
20.....							*.03	*.23				
21.....					*.33							
22.....	.08	.13			.02	.70			.03	.15		
23.....	.13	.01			*1.71	.07	.02	T		.18		
24.....	.18				*.35	*T			.31	.14	.39	
25.....			T	T					.02	.03	.62	
26.....				.20					.25			.31
27.....	T			.47	.04	*1.05		*.10				.01
28.....	T		.67	.53				.18	.30			.61
29.....		.25		.25							.12	.91
30.....	.10	.39	2.94				*.15			.75		.18
31.....	.50	.33				*T			1.28			
Total...	5.12	4.04	6.00	2.84	4.74	5.62	.83	2.01	4.15	2.61	2.01	3.23

* Snow. T means trace.

Daily precipitation, in inches, at MECHANICVILLE, for the year ended June 30, 1921

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	0.16	0.47	0.42	2.97	0.05	0.21	.17			1.23	.94	
2.....				0.02	T	0.37						
3.....	0.46				1.48				.02			.03
4.....	0.13											
5.....				0.12		0.21	T				.01	
6.....				0.01		0.27	.02	.36	.03		.03	
7.....			0.64			*T			.19			
8.....	0.12				0.09		.11	.13		T		
9.....							.02					
10.....		0.15			0.26			.07	.22	.12		
11.....	0.22	1.11	1.08			*T		.40				
12.....	0.60	0.57	0.30	T				.18	.15		.26	.18
13.....			0.47								.23	
14.....	0.58	0.04	0.08			0.28	.02					
15.....	0.02	1.09				0.31	.01		.03	.03		
16.....									.19	.32		
17.....		0.01	0.04	0.14	*T0.74					.35		
18.....	0.26				0.09				T	.19		T
19.....			0.27							.26		
20.....	0.03						T	.06	.12			
21.....					*0.03			.09	.04	.02		
22.....					0.14					.24		
23.....	0.14	0.11			0.63	*T0.54				.06	.20	
24.....	0.10				0.34					.09	.02	
25.....					0.09				.09			
26.....				0.25	*T				.08		.39	.15
27.....				T					.36			.23
28.....			0.02	0.63		*0.48						T
29.....		0.30	0.34	0.02		*0.12		.18				.60
30.....		0.10	0.37	0.30					.40	.50		.26
31.....	0.04	0.02					.07					
Total...	2.86	3.97	4.25	4.46	3.94	2.79	.42	1.47	1.92	3.41	2.08	1.76

* Snow. T Trace.
-tate Engineer.

Station maintained by U. S. Weather Bureau in cooperation with the

Daily precipitation, in inches, at TROY, for the year ended June 30, 1921

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1	.08	.72				.34					.11	
2					.02							
3	.60				1.09	.05			.03			.05
4				.04		.27					.05	
5				.03		.80			.02		.08	
6			.80						.21			
7					.03							
8	.30											
9		.09	.03		.04				.22	.09		
10		1.10	.76			.08						
11	.50	.70	.51									.03
12	.50		.56	.05					.28		.08	.16
13		.05	.04			.18					.12	.02
14	.18					.80			.04	.02		
15		.31							.22	.20		
16			.22	.11	.70							
17					.15					.14		.02
18										.34		
19	.42								.28			
20										.12		
21					.05					.08		
22		.10			1.15	.26				.04	.12	
23					.95					.11		
24	.80				.14				.08			
25				.14					.18		.12	
26						.34			.28			
27			.03	.52	.02	.08					.14	
28		.21	.20	.01					.16			.26
29		.02	.08	.05						.70		1.19
30	.20		2.57		.06					.56		.04
31	.18	.06		.02					.80			
Total..	3.76	3.35	5.80	.97	4.40	3.20			2.80	2.40	.82	1.77

Data furnished by U. S. Weather Bureau.

HOOSICK RIVER WATERSHED

Daily precipitation, in inches, at HOOSICK FALLS, for the year ended June 30, 1921

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1		0.34	0.36	2.10					T	.51		
2			0.02		0.11	0.55	.48				.46	
3	0.38				1.51		T		.07			
4	0.12								T			T
5	0.08			0.02		0.08						
6				0.21			.03	.34	.07		T	
7			0.13			0.02	T	.34				
8	0.52				0.08		.18	.14				
9			0.25				.04			T		
10		0.12	0.30		0.22			.03	.61	.06	T	
11		0.54	0.45			*0.30		.42				
12	0.38	0.36	0.40		*T			.22				.46
13	0.20		0.15		*T				.30	T	T	.19
14		0.20	0.16			0.28	.03				.22	T
15		0.60				0.62	.04		.03	.04	T	
16	0.08								.06	.29	.02	
17	0.04	0.06	0.22	0.07	0.52	*T	T			.34		
18			T	T	0.21	*T		T	T	.04		T
19	0.52	0.01	0.19					T		.32		
20	0.44					*T	.03	.06	.48			

Daily precipitation, in inches, at HOOSICK FALLS, for the year ended June 30, 1921
—Continued

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
21.					*T			.64	.06	.19		
22.					*0.18					.03		
23.	0.51	0.08			0.72	0.18					.20	T
24.	0.26				0.83		T			.13	.04	
25.	0.34				*0.08				.19			
26.				0.22	*T						.41	
27.				0.07		0.26			T			T
28.				0.44	0.03	0.09		.10	.64			.97
29.			0.16	*T					.24		.08	.77
30.			0.22	0.12			.04			.46	.20	3.50
31.	0.02					*T	.14					
Total...	3.89	2.31	3.01	3.25	4.49	2.38	1.01	1.95	3.09	2.41	1.63	6.00

* Snow. T=Trace. Data furnished by U. S. Weather Bureau.

MOHAWK RIVER WATERSHED

Daily precipitation, in inches, at DELTA DAM, for the year ended June 30, 1921

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.		.64	.28	1.15		.19			.05		.16	
2.					.10	1.19	.75					
3.					.95			*.05	.27			.38
4.					.04	.05		*.06				
5.	.09			.06		.25				.56	T	
6.						.52	.03	.38	.43			
7.			.18						.60			
8.	.55				.07		*.18	*.19	.37			T
9.					.22			*.17		.10		
10.	.30	.10	.78		.35			.05	.38			
11.		.29	.09					*.31				1.20
12.	.22	.08	.47					*.18			.23	.21
13.	.29	.09	.25		*.24			*.04	.30		.04	
14.		1.22				.36	*.22					
15.	.77					.94	.59		.07	.07		
16.									.49	.05		
17.			.32	.22	.98			.14		.57		.21
18.					.17	*.55		*.06	.22	.30		
19.	1.45		.05			*.11						
20.	.18				.12		.10	*.05	.73	.20		
21.					.14		.03		.03	T	.11	
22.	.05				.34		.10			.24		
23.	.07	.11			1.15	.63		*.01		.37		.40
24.	.27				.53	*.03					.62	
25.					*.03	*.05			.08		.20	
26.				.03	*.01				.07			
27.				.09		*.33		*.10				
28.			.62	.21				.50	.10		.25	.55
29.		.28				*.03			.21	.24	.15	.15
30.	.18		.15	.14		.02	.12			T		
31.		.56				*.17					.02	
Total...	4.42	3.37	3.19	1.90	5.44	5.42	2.12	2.29	4.40	2.70	1.78	3.10

* Snow. T=Trace.

Daily precipitation, in inches, at BACOT RESERVOIR* NEAR UTICA, for the year ended
June 30, 1921

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.		.54	.40	1.78	.54	.24			.10	.33	.40	.05
2.			.06	.01	.11	1.11	.55				.08	
3.	.30				.24			.03	.15			
4.	.07				.03			.02				.16
5.	.06			.14		.18						
6.						.52	.23	.33	.40		.10	
7.	.15		.20			.02		.18	.51			.15
8.	.14		.12				.13		.22			
9.	.08							.19		.10		
10.	.06	.23	.78		.73			.04	.43	.10		
11.		3.14	.19					.24				
12.	.12	.65	.44	.03	.03			.29				.24
13.	.07	.05	.83		.12			.05			.13	.16
14.		1.74				.16	.07	.03	.33			
15.	.54	.06				.89	.37	.02	.05			.04
16.		.01					.04		.30	.04	.04	
17.			.46	.19	.62		.03	.07		.67		.04
18.					.30	.15		.01	.14	.17		.15
19.	1.12	.73				.15				.18		
20.	.27				.18		.04	.03	.67			
21.					.12			.10		.16		
22.		.19			.22		.15			.38		
23.	.05				1.07	.35	.11			.01	.22	
24.	.34				.42	.01	.01	.01		.29		
25.						.04					.41	
26.					.01						.48	
27.					.04	.03						
28.			.33	.24		.01		.44	.02			
29.		.70	.02						.28		.22	.89
30.	.34	.05	.08			.01	.12			.27	.54	1.77
31.		.22				.07	.02					
Total...	3.71	8.31	3.91	2.39	4.78	3.94	1.87	2.08	3.60	2.20	2.62	3.65

* Formerly known as Deerfield Reservoir. Data furnished by the Consolidated Water Company of Utica.

Daily precipitation, in inches, at GRAEFENBURG NEAR UTICA, for the year ended
June 30, 1921

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.		.90	.15	2.10	.25	.25			.06	.15	.22	
2.					.08	1.00	.25				.04	
3.					.12	.06		.02	.15			
4.	.12							.10				.11
5.	.10					.25						
6.				.05		.28	.12	.10	.15		.15	
7.	.02		.18			.06		.10	.25			
8.	.25											
9.										.05		
10.		.75	.10		.35			.12	.20			
11.		.72	.60					.10				
12.	.12	.04	.55					.20				.25
13.			.65		.06						.15	.15
14.		1.20				.25			.25			
15.	.45	.20				1.10	.20	.15				
16.									.15		.03	
17.			.10	.25	.30		.06			.60		.03
18.					.30	.05			.15	.23		.11
19.	1.35					.06				.15		
20.	.02				.30		.03		.23			

Daily precipitation, in inches, at GRAEFENBURG, NEAR UTICA, for the year ended June 30, 1921—Continued

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
21.....					.15					.15		
22.....		.12			.25		.04			.23		.10
23.....	.05				1.20	.40					.30	
24.....	.26				.60					.25		.60
25.....	.10					.10					.20	
26.....											.50	.15
27.....												
28.....			.20			.05		.15				
29.....		.40									.20	.15
30.....	.18		.02							.18	.35	1.45
31.....							.06					
Total...	3.02	4.33	2.55	2.40	3.96	3.91	.76	1.04	1.59	2.04	2.14	3.10

Data furnished by the Consolidated Water Company of Utica.

Daily precipitation, in inches, at the SOUTHERN RESERVOIRS* NEAR UTICA, for the year ended June 30, 1921

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....	.05	.70	.33	2.10	.32	.25			.08	.32	.50	
2.....			.02		.11	1.40	.55				.06	
3.....	.10	.02			.23				.18			
4.....	.20							.09				.13
5.....	.02			.10		.16						
6.....				.04		.60	.36	.20	.35		.10	
7.....	.11		.23		.06	.04		.22	.45			
8.....	.24		.02				.16		.18			
9.....	.05				.05			.14	.03	.13		
10.....	.24	.50	.31		.55			.05	.52	.13		
11.....		.81	.42					.35				
12.....	.14	.45	.45					.18				.28
13.....	.16	.11	.60		.08			.08			.17	.21
14.....	.17	.65				.22	.07	.05	.23		.02	
15.....	.39	.18				1.20	.34	.05	.08			
16.....		.07					.05		.25	.06	.03	
17.....			.29	.37	.80	.07	.04	.07		.54		.03
18.....					.20	.08		.04	.18	.24		.13
19.....	1.05	.09	.02			.07				.42		
20.....	.06				.15		.04	.02	.63			
21.....					.14					.13		
22.....		.09			.24		.09	.10		.46		
23.....					1.40	.42	.04				.30	
24.....	.33				.60		.03	.04		.35	.03	
25.....	.02								.06		.18	
26.....					.03				.03		.58	.12
27.....					.05	.10		.05	.11			
28.....			.33	.14		.10		.52				.08
29.....		.63	.02						.28		.30	.32
30.....	.10	.03	.08	.13			.15			.22	.35	2.05
31.....		.03		.15		.09						
Total...	3.45	4.37	3.19	3.03	5.01	4.80	1.93	2.25	3.72	3.00	2.62	3.35

* Formerly known as Adrean Reservoir.

Data furnished by the Consolidated Water Company of Utica.

Daily precipitation, in inches, at CANAJOHARIE, for the year ended June 30, 1921

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1	.05	.49	.22	2.17	.07	.52			T	.29	.90	
2	.01		.02		.02	.73	.22	*T				
3	.15	T		T		.26		*T	T		T	
4	.07	T			.02			*.02				
5	.04		T	.17	T	.56					.09	T.09
6			.09	T	T	.17	.07	.27	.13			
7	.01		.29	T	T			*T	.45		T.01	
8	.05		.01	T		.12	*.10	*.14	.01			
9	.03			T		.12		T.06		.10		
10	T	.28	.48	T	.14	T		T	.21	.04		
11		.42	.09	T		.03		*.47				
12	.45	.17	.67	T.03				*.32		T		.29
13	.13	.38	1.25	T	*T			*.01	.32	T	T.34	.19
14		.12	T	T	T	.44	*.09	.03				
15	.25	1.14		T		.35	.45		.03	.06		
16			.21	T					.28	.05		
17		.02	.03	.16	*.85		*T	.06		.56		.09
18	.01				.04	*.01			.03	.06		.04
19	1.04		.01	T		*.02				.22		
20	.01		T		.03		.05	*.09	.63	T		
21				T	*.12			*.03	T	.06		
22	.05	.02			.06	*T	.02	*.01		.10		
23	.65	T.02	T	T	*1.58	.31	.01	*T		.01	.40	
24	.30	T	T	T	*.29					T.24		.43
25	.04		T	T	*.10				.04	T	.48	
26			T	.02					.37		T.08	.21
27		T	1.17			*.10		*T	T		T	.03
28		.52	T	.23	.03	.03		*.37	.02		.01	.15
29		.02	.56	.01			*.16				.08	.06
30	.08	.01		.05		T	*.02			1.50	.42	.04
31												
Total...	3.42	3.61	5.10	2.85	3.85	3.27	1.19	1.88	2.52	3.29	2.81	1.62

* Snow. T means Trace.

Daily precipitation, in inches, at TRIBES HILL, for the year ended June 30, 1921

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1				2.01	0.41					.61	.80	
2					0.30	0.60						
3							.40					
4	0.70						.40	.10	.21			.20
5				0.42								
6						1.41					.20	
7	0.20		0.62						.54			
8	0.40				0.20			.20				
9							.10					
10	0.10	0.32			0.41				.30	.21		
11		0.90	0.60			0.12		.80				
12		1.10										.20
13	0.40		1.40									.20
14	0.10	0.20					.10				.40	
15	0.10					1.15	.30		.50			
16												
17			0.30						.40	.30		
18					0.60					.80		
19	0.70		0.30							.20		.15
20									.52			

Daily precipitation, in inches, at TRIBES HILL, for the year ended June 30, 1921—
Continued

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
21					*T0.15			.20		.10		
22	0.40									.10		
23		0.30				0.50						
24	0.30				2.01		.10			.50	.30	
25												
26									.40		.62	
27				0.10								
28				0.60		0.30		.20				
29		0.20	0.62									.80
30										1.15		.40
31	1.00						.20					
Total...	4.40	3.02	3.84	3.13	4.08	4.08	1.60	1.50	2.87	3.97	2.32	1.95

* Snow. T means Trace.

Data furnished by U. S. Weather Bureau.

Daily precipitation, in inches, at SCOTIA, for the year ended June 30, 1921

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1					.31	1.10	.08				1.09	
2	.42				.62				.06			
3							*T	*T				
4	.22			.90				*T				
5				.30		.93		.32			.09	
6			.61						.04			
7					.11			*.12	.40			
8												
9					.28			T	.52			
10		1.90				T						
11		.10	1.10					*.83				.42
12	1.12	1.00	2.20						.29			
13		.15	.10								.39	.14
14	.40	.99				1.07	.06				.12	
15	.22	.05							.05	.18		
16			.22	.51					.31			
17					1.01					.43		.15
18										.22		
19	.32								.50			
20				.21			T	*.38	T	T		
21					*.23					.09		
22	.20	.09				.48						
23	.16				1.85				.09	.89	.19	
24	.26											
25											.43	
26				.29				*T	.48			.57
27				.83	.04	*.55		*T				.26
28			1.06					.39			.09	.33
29	.12	.22		.17						.99		.48
30			2.96				*.16					.36
31	.51						T		.76			
Total...	3.95	4.50	8.25	3.21	4.45	4.13	.30	2.04	3.50	2.75	2.40	2.71

* Snow. T means Trace.

WEST CANADA CREEK WATERSHED

Daily precipitation, in inches, at HOFFMEISTER, for the year ended June 30, 1921

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.						*1.74	.99					
2.					1.0	*T	.02	*T	.40			
3.	.56							*.19				.67
4.	.96											
5.	.30			T ¹¹	.29	*1.15	T	*.39	.40			
6.	T		.56			*.04		T	.85			
7.	.64		T		T		*.22	*.18	.35			
8.	T						*T			.29		
9.	.12	.75						*.22	.61	.17		
10.		.31	.63		.30			*.21				
11.	.71	T	.69				*T	*.22				1.99
12.	.67	.20	.41		*T		*.05		.34		.52	.35
13.		1.84			*.17	.74		*.30			.25	.03
14.	.75					1.60	1.04	T	.17	.65		
15.						*T	*.09		.62	.32		
16.			.30	.09	*.71	*.15	*.29	.27		.67		
17.					*.22	*.17		*.08	*.20	.24		.14
18.	1.12	T	.15		*T	*.15	*.08			.02		
19.	.44				*.09	*.03		*.05	.62			
20.						*T	.19		.06	.06		
21.					*.43		.20		T	.41		
22.	T	T			*.85	*.83				.04	.16	
23.	.20				*1.33	*.04	*.12	*.50		.23		
24.					*T	*T			.49			
25.					*T			*.04			.75	
26.				.14	*T	*.37		*.19	.19			
27.			.98	1.44	*T	*.20		*.40	.18			
28.						*.08			*.15		.31	.35
29.	T	.88				.08	*.22			1.45	.30	.34
30.	.11	.17	1.60			*.16	*T		.76	.45	.08	.01
31.	1.17	1.02		.72								
Total...	7.75	5.17	5.32	2.50	5.39	7.53	3.51	3.24	6.39	5.13	2.37	3.88

T Trace. * Snow.

Daily precipitation, in inches, at GRAY, for the year ended June 30, 1921

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.			.14	1.88	.46	.40				.12	.31	.02
2.					.24	1.63	.82		.14			
3.	.22				.94				.26			
4.	.18											.60
5.	.15			.45		.28						
6.						.59	.19	.72	.26			
7.	.11		.56						.68			
8.	.39		.12				.09		.21			
9.			.02					.31		.34		
10.	.30	.44			1.22			.49	.49	.10		
11.		.60	.81			.10						.84
12.	.17	1.01	.68		.02				.40			.17
13.	.07		.40		.01				.41	.02	.32	
14.		.44				.29					.19	
15.	.81	.02				1.01	1.03		.11	.20		
16.									.57	.10		
17.			.46		.62	.01		.47		.64		
18.						.03			.02	.32		.10
19.	1.40	.09	.38			.16				.14		
20.	.18								.79			

Daily precipitation, in inches, at GRAY, for the year ended June 30, 1921—Continued

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
21.....										.15		
22.....					.69		.28			.34		
23.....		.12			1.28	.61	.18					
24.....	.33				.57		.06	.02		.28		
25.....									.12			
26.....				.16							.68	
27.....				.06		.28		.04	.09			
28.....			.50	.59		.01		.07				.21
29.....		1.07	.10									
30.....	.18	.30	.15								1.11	.53
31.....		.61				.24				.86		1.69
Total...	4.49	4.70	4.32	3.14	6.05	5.62	2.70	2.12	4.55	3.61	2.61	4.16

Data furnished by the Consolidated Water Company of Utica.

Daily precipitation, in inches, at HINCKLEY, for the year ended June 30, 1921

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....		1.50	0.30	1.55	.74					.54		.04
2.....											.25	
3.....	0.73				1.0		.72		.16			
4.....				.02								.62
5.....	0.08											
6.....	0.06				.15	1.12			.15			
7.....			0.28						.48			
8.....	0.62		0.24		.08				.36			
9.....	0.03											
10.....	0.09	0.30			.87			.4	.58			
11.....		0.22	0.40					*.6				1.37
12.....		0.11	0.90									
13.....	0.54		0.12		*.2				.31			
14.....		0.47				1.02						.17
15.....	0.83					.87			.12	.27		
16.....		0.08							.42	.28	.32	
17.....			0.53		.72			.34		.97		
18.....										.41		.16
19.....	1.31					*.57				.13		
20.....									.82			
21.....									.24	.11		
22.....		0.15					.52			.35		
23.....	0.22				1.07	.54					.11	
24.....	0.42						*.37	*.2		.16		
25.....									.11			
26.....											.72	
27.....				.33					.28			
28.....			0.53	.67				.52	.04			
29.....		0.81				*.67	*.22		.2			.67
30.....	0.20	0.36								.61	.51	1.45
31.....		0.51										
Total...	5.13	4.51	3.30	2.57	4.83	4.79	1.83	2.06	4.27	3.83	1.91	4.49

* Melted snow.

Daily precipitation, in inches, at TRENTON FALLS, for the year ended June 30, 1921

DAY	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1.....		1.05		1.80	0.82	0.15			.15	.58	.20	
2.....			0.03	0.05	0.08	*1.75	.57	T	.30		.10	
3.....	0.50				0.90			.03	T			
4.....	0.10			T	0.08	0.05		.05				.33
5.....	0.05			0.08	0.03	0.20						
6.....					0.05	*0.45		.43	.45		T	
7.....	0.08		0.25			T	.15		.78			
8.....	0.48		0.11		0.05		.15	.20	.40		T	
9.....	0.03	0.20			T		.02			.13		
10.....	0.04	0.30	0.30		0.75	T		.20	.54	T		
11.....			0.40			0.05		.35				
12.....	0.03		0.55	T	*T		T	.20				.90
13.....	0.60		0.20		*0.20			T	.32	.10	.13	
14.....		0.30	T		*0.05	0.25	.23	.05			.10	T
15.....	0.90					0.93	.95	.05	.18	.33		T
16.....						*0.05	.02		.55	.13	.03	
17.....			0.45	0.05	0.80	*0.05		.20		.90		
18.....			T		*T0.45	*0.15	T	.02	.18	.37		.13
19.....	1.25		0.10		T	*0.11				.17		
20.....	T				0.15		.02		.80			
21.....					*0.18	*0.03		.07	T	.02		
22.....	0.05				0.30		.17		.08	.33		
23.....	0.35	0.25			*T0.09	0.55	.02			T	.14	
24.....	0.25				0.75	0.55	T	.02		.19		
25.....	0.03				*T			T	.08		.18	
26.....					*T	T		.02			.50	
27.....				0.05		*0.25		.03				
28.....			T	0.53	*T	*0.03		.40	T			T
29.....		0.25	T			*0.03			.25	.05	.11	1.25
30.....	0.20	0.60	T			0.01	.05			.38	.40	1.37
31.....	T	0.32				*0.15	.05				.03	
Total...	4.94	3.27	2.39	2.56	5.73	5.79	2.40	2.32	5.14	3.68	1.92	3.98

* Snow. T Trace.

Station maintained by the U. S. Weather Bureau in cooperation with the State Engineer.

CATSKILL WATERSHEDS

Stations maintained by the Board of Water Supply of New York city.

Monthly rainfall, in inches, on CATSKILL WATERSHEDS, for the year ended June 30, 1921

STATION	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
ESOPUS CREEK												
Phoenicia.....	5.00	5.44	6.99	2.24	5.89	6.40	2.24	4.30	4.76	5.70	3.20	1.76
Slide Mountain.....	8.16	4.52	7.06	2.63	6.71	5.55	2.14	4.48	5.89	7.36	2.87	2.77
Highmount.....	6.19	5.05	7.21	1.89	4.91	3.56	1.76	3.13	3.13	3.68	2.44	2.63
Edgewood.....	5.81	5.18	6.76	2.42	5.75	4.45	1.76	3.30	3.91	6.21	4.31	3.46
Lakehill.....	7.00	5.13	6.88	2.42	4.49	6.10	1.82	2.81	5.36	6.74	2.97	3.61
Kingston.....	4.24	4.00	4.98	3.96	4.44	5.14	1.60	3.27	3.79	7.17	2.44	3.21
West Hurley.....	4.85	4.34	7.27	1.33	4.51	4.78	1.63	2.32	4.92	5.36	2.45	3.84
Brown Station.....	4.76	5.75	6.97	1.53	5.08	4.84	1.63	3.11	4.93	5.64	2.68	2.78
West Shokan.....	6.41	5.25	6.00	2.37	6.94	7.41	2.39	5.74	5.97	7.75	2.89	2.01
Zena.....	4.75	4.46	7.81	1.36	4.18	5.71	1.73	3.38	5.07	5.20	2.32	3.46
Coldbrook.....	8.26	6.29	7.00	1.98	5.62	7.98	2.11	3.48	4.84	6.60	3.25	2.79
Big Indian.....	5.41	4.81	6.96	2.40	5.57	5.62	1.87	4.93	3.69	5.31	2.22	2.62
ROUNDOUT CREEK												
Grahamsville.....	6.86	2.84	6.22	3.11	4.50	5.75	2.01	3.16	3.28	5.44	2.46	2.93
Sundown.....	6.50	4.93	5.64	3.56	4.12	4.88	1.90	2.74	3.38	5.58	2.37	2.41
Peekamoose.....	6.52	5.18	4.35	3.81	5.30	6.80	2.53	4.37	3.73	7.95	4.14	1.84
Lackawack.....	5.28	4.87	5.38	2.90	4.89	4.75	1.99	3.76	3.04	5.21	2.67	1.62
SCHOHARIE CREEK												
Windham.....	3.92	4.03	5.38	3.46	4.62	3.01	1.30	2.90	1.60	4.77	2.97	2.90
Elka Park.....	7.16	4.80	6.36	5.42	5.82	8.66	2.31	4.90	4.23	7.89	3.22	3.86
Lexington.....	4.47	5.82	5.23	3.26	4.73	3.86	1.42	3.43	2.04	4.60	2.69	3.39
Prattville.....	4.05	4.98	5.62	3.26	4.82	3.41	1.16	3.31	2.38	4.26	1.90	3.46
Grand Gorge.....	4.58	5.00	6.25	3.08	4.55	3.10	1.40	2.97	2.57	4.06	2.79	3.25
Stamford.....	5.00	4.66	6.73	3.88	4.35	3.42	1.74	2.66	2.22	3.74	3.08	2.97
Manorkill.....	4.26	7.04	6.31	2.80	4.44	3.50	1.95	3.12	1.48	4.37	2.75	4.45
Esperance.....	3.92	4.51	7.37	3.63	4.16	3.62	1.84	2.42	2.48	4.45	2.40	2.00
Gilboa.....	4.60	4.49	5.30	3.07	4.18	3.16	1.24	3.03	2.01	4.68	2.23	3.11
Westkill *.....	.....	.....	5.64	4.04	5.04	5.25	2.32	3.66	2.78	5.93	3.34	2.68
CATSKILL CREEK												
Preston Hollow.....	4.20	6.10	7.10	2.09	4.12	3.07	.81	3.10	1.60	4.97	2.52	3.08
Oak Hill.....	3.49	5.59	5.78	2.60	4.96	2.98	1.20	3.62	1.78	5.75	2.68	3.16
Westerlo.....	4.60	6.98	5.50	1.86	5.14	2.74	.76	1.96	1.64	5.74	2.52	3.13

* Standard 8-inch U. S. W. B. gage established September 3; elevation 1,618 feet.

Mean monthly rainfall, in inches, on CATSKILL WATERSHEDS

YEAR	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total for year
ESOPUS CREEK — ABOVE OLIVE BRIDGE DAM													
1906.....	2.85	2.26	4.80	3.85	5.01	6.16	4.42	3.76	3.18	5.47	2.26	4.08	48.10
1907.....	2.59	1.66	1.20	2.17	3.83	3.45	3.13	1.17	11.49	6.78	7.06	5.80	50.33
1908.....	3.49	6.40	2.93	2.98	9.23	2.29	6.32	2.04	2.46	4.21	0.57	2.58	45.50
1909.....	4.82	6.97	4.35	5.20	4.48	4.38	2.06	4.83	4.17	1.40	1.98	4.63	49.27
1910.....	7.61	4.37	0.93	10.18	2.95	4.59	2.02	3.93	5.21	1.02	3.70	2.30	48.81
1911.....	2.60	1.94	3.90	2.37	1.06	5.94	3.19	4.83	4.25	7.50	3.50	2.91	43.99
1912.....	2.38	2.96	5.96	5.76	4.36	1.72	3.25	7.47	3.44	4.84	4.08	4.70	50.92
1913.....	4.26	2.28	7.70	3.81	3.74	1.01	1.90	4.86	4.02	6.76	5.60	2.93	48.87
1914.....	3.40	2.44	4.02	5.94	2.99	3.18	3.49	3.91	0.56	2.97	3.32	3.69	39.91
1915.....	6.85	5.32	0.21	2.16	2.27	2.96	8.59	8.93	2.99	2.48	3.90	5.86	52.52
1916.....	1.64	4.48	3.23	2.63	3.35	5.33	8.14	1.96	4.23	3.15	4.37	2.98	45.49
1917.....	4.14	2.15	3.53	2.47	4.27	6.72	4.04	6.58	1.09	7.70	1.08	2.45	46.22
1918.....	3.49	2.65	2.75	4.22	4.62	3.29	3.35	2.33	7.90	2.59	2.20	3.52	42.91
1919.....	2.22	2.40	5.75	3.18	5.81	4.32	7.30	4.44	5.10	2.91	5.77	1.98	51.18
1920.....	2.19	3.37	4.06	5.61	2.00	6.06	6.05	5.11	6.99	2.05	5.42	5.67	54.58
Mean.....	3.64	3.44	3.69	4.17	4.00	4.09	4.48	4.41	4.47	4.12	3.65	3.74	47.91

Mean monthly rainfall, in inches, on CATSKILL WATERSHEDS

YEAR	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total for year
RONDOUT CREEK—ABOVE HONK FALLS AND LACKAWACK													
1906.....	2.69	2.64	3.91	4.54	4.34	5.23	5.51	4.47	3.87	4.40	2.15	4.20	47.95
1907.....	3.43	1.93	1.93	2.19	3.68	3.69	2.95	1.88	9.42	5.50	6.32	5.03	47.95
1908.....	3.12	6.24	3.53	4.02	7.64	1.75	5.08	2.59	2.64	3.74	0.72	3.09	44.16
1909.....	4.82	6.61	3.99	4.71	3.36	4.39	2.07	4.46	3.54	1.25	1.86	4.47	45.53
1910.....	7.07	4.53	1.03	8.30	3.60	4.22	2.34	4.08	5.25	1.18	3.36	2.25	47.21
1911.....	3.44	1.99	4.42	3.11	1.16	6.57	3.27	5.14	4.17	7.10	3.43	3.08	46.88
1912.....	2.24	2.41	5.86	5.77	3.59	1.91	2.82	7.32	3.79	3.92	3.02	4.78	47.43
1913.....	5.05	2.61	7.65	4.67	3.46	1.44	3.38	6.04	4.20	6.53	4.74	2.72	52.49
1914.....	3.33	2.13	3.57	4.91	2.98	4.28	4.06	4.14	0.71	2.64	2.74	3.82	39.31
1915.....	6.63	5.41	0.33	2.33	3.00	3.45	9.83	7.17	3.03	2.57	3.40	6.11	53.26
1916.....	2.35	4.87	3.84	3.64	3.71	5.76	9.08	2.19	5.31	3.25	3.95	3.61	51.56
1917.....	4.04	2.76	3.92	2.15	3.32	6.76	5.51	8.05	1.31	7.10	1.48	2.25	48.65
1918.....	3.76	3.79	2.72	4.39	3.28	3.71	3.40	2.71	8.18	3.29	1.84	4.72	45.77
1919.....	2.79	2.38	5.10	3.40	5.11	3.77	6.07	5.78	5.13	3.43	6.34	4.29	51.79
1920.....	2.56	3.57	4.12	4.17	2.58	5.96	6.29	4.30	5.40	3.34	4.70	5.54	52.53
Mean.....	3.82	3.59	3.73	4.15	3.65	4.19	4.78	4.69	4.40	3.95	3.34	3.88	48.16
SCHOHARIE CREEK—ABOVE PRATTSVILLE													
1907.....	2.05	1.54	1.04	2.33	3.46	3.27	3.28	0.76	8.29	5.51	6.08	4.66	42.27
1908.....	2.93	5.51	2.31	2.68	7.53	2.22	4.36	2.32	2.82	4.31	0.44	2.01	39.44
1909.....	4.12	4.82	3.38	4.47	4.24	4.19	1.53	3.23	3.17	1.35	1.85	4.14	40.40
1910.....	6.67	3.42	0.62	7.76	3.07	5.03	1.54	2.23	4.22	0.80	0.94	1.45	41.75
1911.....	1.85	1.13	2.13	1.43	1.43	6.09	2.06	4.16	3.21	4.68	1.99	1.79	31.95
1912.....	1.66	2.14	4.06	4.88	3.64	1.52	2.60	3.84	3.48	3.31	3.14	2.86	37.13
1913.....	2.78	2.00	5.24	3.22	3.05	1.58	1.46	3.56	3.16	5.34	5.59	1.94	38.92
1914.....	2.28	2.28	4.50	5.22	3.27	2.96	4.22	4.71	0.87	1.93	2.72	2.62	37.58
1915.....	4.18	4.09	0.22	2.21	2.19	2.34	8.01	7.50	3.77	2.32	2.53	5.54	44.90
1916.....	1.06	4.31	2.81	2.66	2.82	4.02	6.44	4.72	4.22	2.11	3.13	2.12	40.42
1917.....	3.11	1.30	2.62	1.71	4.04	5.63	2.61	6.03	1.15	8.25	0.88	2.28	39.61
1918.....	3.19	2.03	2.55	4.34	5.02	3.14	2.88	2.37	6.76	2.56	1.36	3.05	30.25
1919.....	2.00	1.58	4.65	3.16	5.32	4.74	8.42	3.57	5.71	2.48	4.61	1.71	47.95
1920.....	2.16	3.97	4.88	4.05	1.76	5.50	4.90	4.91	5.65	3.89	5.01	4.84	51.52
Mean.....	2.86	2.87	2.93	3.58	3.63	3.73	3.88	3.85	4.03	3.49	3.16	2.93	40.94
CATSKILL CREEK—ABOVE OAK HILL													
1907.....	1.92	1.28	1.16	2.38	3.25	3.15	3.31	0.85	6.58	4.18	4.91	3.52	36.49
1908.....	2.43	4.01	1.83	2.15	5.86	1.58	4.00	3.01	1.59	3.35	0.39	1.57	31.77
1909.....	3.56	3.76	2.79	3.00	3.82	3.52	2.36	2.47	2.74	0.96	1.50	3.59	34.17
1910.....	4.67	3.02	0.48	5.70	2.94	4.82	1.21	1.55	4.07	0.91	3.57	0.92	33.86
1911.....	1.32	1.13	2.07	1.55	1.41	7.06	2.20	3.38	2.94	4.32	1.45	1.87	30.70
1912.....	1.71	2.12	3.50	4.60	3.36	1.08	2.63	3.80	3.27	3.86	2.78	2.37	34.98
1913.....	2.66	1.87	4.60	3.05	3.18	2.16	1.83	1.37	2.67	4.89	4.73	1.83	34.84
1914.....	2.10	2.14	4.78	5.32	3.26	2.50	3.97	4.18	0.64	1.53	2.49	2.43	35.34
1915.....	3.40	3.31	0.09	2.03	1.91	2.60	6.93	7.20	2.78	2.22	2.60	5.66	40.73
1916.....	1.09	4.01	3.28	3.56	2.88	3.22	4.42	3.70	3.67	1.82	2.76	2.11	36.52
1917.....	1.76	1.46	2.49	2.07	4.12	4.01	1.49	5.65	1.08	7.38	0.81	2.22	34.54
1918.....	2.57	1.14	2.42	3.75	4.02	2.39	2.74	2.83	5.03	2.05	1.15	1.19	32.00
1919.....	1.60	1.21	3.17	2.61	4.71	4.02	6.23	3.58	5.24	2.14	3.71	1.31	39.33
1920.....	1.83	3.63	4.35	2.84	2.08	5.67	4.09	5.95	6.01	2.56	4.66	3.06	46.73
Mean.....	2.33	2.44	2.64	3.18	3.35	3.41	3.39	3.52	3.45	3.01	2.68	2.46	35.86

NUMBER OF STATIONS USED IN OBTAINING ABOVE AVERAGES

Esopus creek.—January–November, 1906, 6; December, 1906, 7; January–June, 1907, 8; July and August, 1907, 11; September–December, 1909, 12; January, 1910, 11; February–March, 1910, 12; April, 1910–January, 1915, 10; February–March, 1915, 11; April, 1915, 10; May–October, 1915, 11; November, December, 1915, 12; January–March, 1916, 13; April, 1916, 12; May–November, 1916, 13; December, 1916–February, 1917, 12; March–December, 1917, 11; January, February, 1918, 9; March, April, 1918, 10; May–December, 1918, 11; January, 1919–December, 1920, 11.

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Schoharie creek.—January–June, 1907, 6; July–December, 1907, 7; January, 1908–March, 1910, 5; April, 1910–April, 1917, 4; May and June, 1917, 5; July and August, 1917, 6; September and October, 1917, 7; November and December, 1917, 8; January, 1918–August, 1920, 4; September–December, 1920, 5.

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